TOSHIBA

FILE NO. 810-200574

SERVICE MANUAL

HDD & DVD RECORDER

RD-XS64SF
RD-XS64SG

SEP. 2005 Ⓢ

CONTENTS

1. Precautions
2. Product Specification
3. Software Update
4. Disassembly and Reassembly
5. Troubleshooting
6. Exploded View and Parts List
7. Electrical Parts List
8. Block Diagram
9. Wiring Diagram
10. PCB Diagrams
11. Schematic Diagrams
12. Operating Instructions
13. Circuit Operating Descriptions
14. Reference Information

1. Precautions

1-1 Safety Precautions

1) Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(1) Be sure that no built-in protective devices are defective or have been defeated during servicing. (1)Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
(2)When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fish papers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

(2) Be sure that there are no cabinet openings through which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

(3) Leakage Current Hot Check-With the instrument completely reassembled, plug the AC line cord directly into a 230V(220V ~ 240V) AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.
Any current measured must not exceed 0.5mA. Reverse the instrument power cord plug in the outlet and repeat the test. See Fig. 1-1.
Any measurements not within the limits specified herein indicate a potential shock hazard that must be eliminated before returning the instrument to the customer.

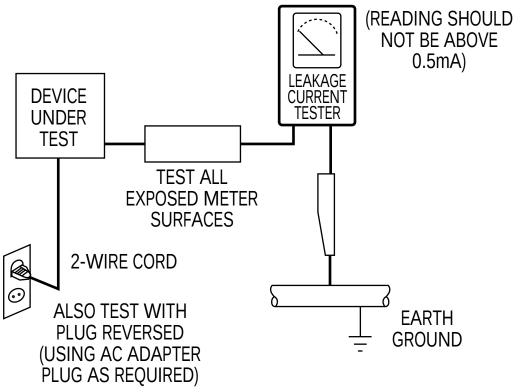

(READING SHOULD NOT BE ABOVE 0.5mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
TEST ALL EXPOSED METER SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Fig. 1-1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer. See Fig. 1-2.

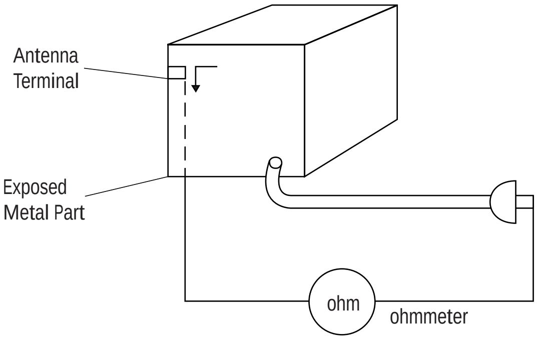


Fig. 1-2 Insulation Resistance Test

2) Read and comply with all caution and safety related notes on or inside the cabinet, or on the chassis.

3) Design Alteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4) Observe original lead dress. Take extra care to assure correct lead dress in the following areas:
   (1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring, Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.

5) Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/ or wiring that meet original specifications.
   Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

6) Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an (⚡)or a (⚠)on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

CAUTION : Before servicing units covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note : If unforseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. Remember: Safety First.

1-2-1 General Servicing Precautions

(1) a. Always unplug the instrument's AC power cord from the AC power source before (1) re-moving or reinstalling any component, circuit board, module or any other instrument assembly, (2) disconnecting any instrument electrical plug or other electrical connection, (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

c. Do not apply AC power to this instrument and /or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Note : Refer to the Safety Precautions section ground lead last.

(2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(3) The components used in the unit have a specified flame resistance and dielectric strength.
When replacing components, use components which have the same ratings. Components identified by shading, by(⚠) or by (⚠) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.

(4) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.

(5) After servicing, always check that the removed screws, components, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

1-2-2 Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts(see note) should be more than 1 Megohm.

Note : Accessible conductive parts include metal panels, input terminals, earphone jacks, etc.

1-3 ESD Precautions

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.
Such components commonly are called Electrostatically Sensitive Devices(ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

(1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

(2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

(3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.

(4) Use only an anti-static solder removal devices. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESD devices.

(5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.

(6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it.(Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).

(7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

1-4 Handling the optical pick-up

The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

(1) Place a conductive sheet on the work bench (The black sheet used for wrapping repair parts.)

(2) Place the set on the conductive sheet so that the chassis is grounded to the sheet.

(3) Place your hands on the conductive sheet(This gives them the same ground as the sheet.)

(4) Remove the optical pick up block

(5) Perform work on top of the conductive sheet. Be careful not to let your clothes or any other static sources to touch the unit.

- ◆ Be sure to put on a wrist strap grounded to the sheet.
- ◆ Be sure to lay a conductive sheet made of copper etc. Which is grounded to the table.

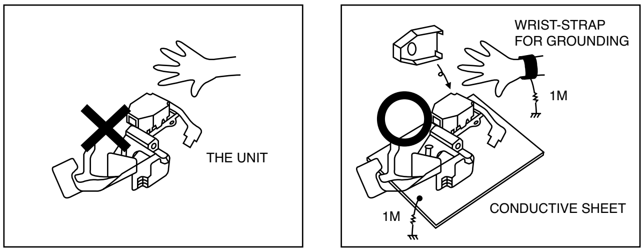


Fig.1-3

(6) Short the short terminal on the PCB, which is inside the Pick-Up ASS'Y, before replacing the Pick-Up. (The short terminal is shorted when the Pick-Up Ass'y is being lifted or moved.)

(7) After replacing the Pick-up, open the short terminal on the PCB.

MEMO

2. Product Specification

2-1 Product Specification

General	Power requirements		AC 220~240V ,50Hz
	Power consumption		45 Watts
	Weight		4.2 Kg
	Dimensions		432mm(W) x 259mm(D) x 78.5mm(H)
	Operating temp		+5°C to +35°C
	Other conditions		Keep level when operating. Less than 75% operating humidity
Input	Video		Composite Video : 1.0 V p-p at 75ohm load, sync negative
	Audio		Max. Audio input level : 2Vrms
	DV Input		IEEE 1394(4p) compatible jack
	Receivable Channels		PAL-B/G, D/K, SECAM-L/L’ (Only France)
	Scart Jack	AV1 (Scart TV)	Video : Composite, Audio : analogue
		AV2 (Scart Ext)	Video : Composite, RGB Audio : analogue
Output	Audio		Analogue output jacks X 2
			Optical/coaxial digital audio output
	Video		Composite Video : Video output jack X 1
			S-Video output X 1 (Y: 1.0Vp-p, C:0.286Vp-p at 75Ω load)
			Component output X 1 (Y: 1.0Vp-p ,Pb:0.70Vp-p, Pr:0.70Vp-p at 75Ω load)
			HDMI/DVI (576p)
	Scart Jack	AV1 (Scart TV)	Video : Composite, RGB Audio : analogue
Recording	Picture compression format		MPEG-2
	Audio compression format		Dolby digital 2ch/256kbps, MPEG-2
	Recording Quality		XP (about 8.5 Mbps), SP (about 4.5 Mbps), LP (about 2.5 Mbps),
			EP (about 1,6 Mbps or about 1,2 Mbps)
	Audio frequency characteristics		20 Hz ~ 20 KHz
HDD capacity	160GB		

MEMO

3. Software Update

3-1 Drive Firmware Update

3-1-1 Introduction

Toshiba will often support software update to improve the performance of DVD Recorder & VCR to the latest status.

3-1-2 How to make an update disc

NOTE

- Recommended Application Program
  - Nero Burning / Easy CD Creator ..etc
- Option
  - Name : SDM2224
  - Extension name : “*.REC”
  - Multisession : No Multisession
  - File name lenght : Max. of 11 = 8 + 3
  - Format : Mode 1
  - Character set : ISO 9660 or Joliet Format
  - CD Close & Dise at once

WARNING

Very important : please read the notice below before updating your unit.

The following events may interrupt the update process and MAY RESULT IN PERMANENT DAMAGE TO THE UNIT WHILE UPDATING

① Unplugging the power cord.

② Power Outage.

③ Dirt or Scratches on the disc.

④ Opening a disc tray during processing.

1) Press **OPEN/CLOSE** to open the disc tray.
2) Insert the update CD-R disc with the software update, label facing up.
3) Press **OPEN/CLOSE** to close the disc tray.

* It takes about 1~2 minites before the mesage below appears.

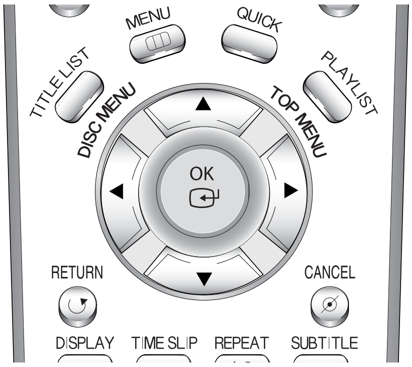
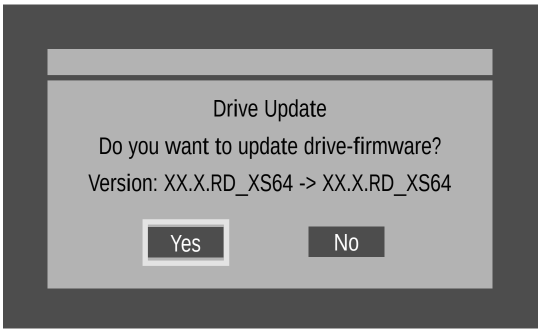


Fig. 3-2 Remote Control



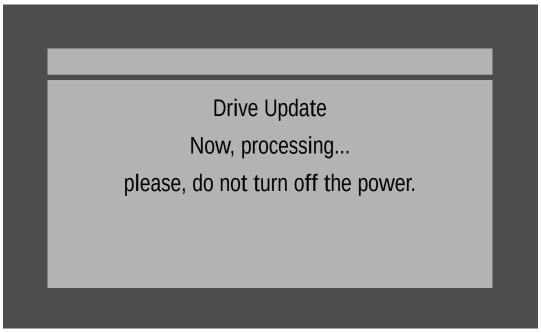
Drive Update
Do you want to update drive-firmware?
Version: XX.X.RD_XS64 -> XX.X.RD_XS64

Fig. 3-1

Atfer checking old and new version, select “Yes” or “No” with “ ◀ ” or “ ▶ ” on the remote control.
* The Version is indicated by “XX.X modelname”

* If you don’t see the message above, try another disc. Generally, this is caused by disc quality and by disc creating problem.

4) Press the **OK** button on the remote control (Fig. 3-2).

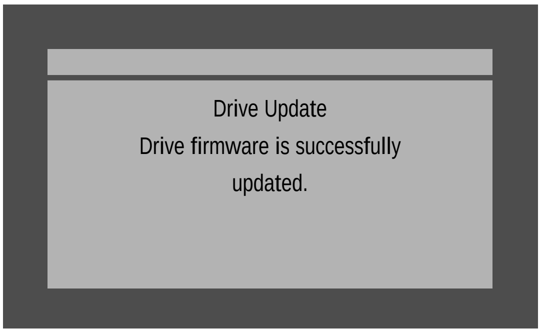


Drive Update
Now, processing...
please, do not turn off the power.

Fig.3-3

You will see “LOAD” on FLT Display.

5) It takes about 1~2 minutes to complete the update.
The message below will be displayed in the screen after update is completed and the tray will open automatically.



Drive Update
Drive firmware is successfully
updated.

Fig. 3-4

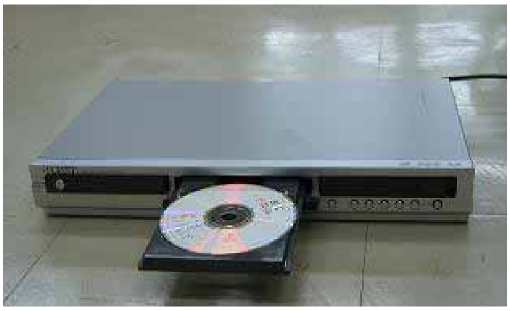


Fig. 3-5

6) After removing the update disc, turn off the unit with power button.
Turn on the power again the tray will then close.
The drive firmware is now complete.

3-2 Flash Update

3-2-1 Introduction

Toshiba will often support software update to improve the performance of DVD Recorder & VCR to the latest status.

3-2-2 How to make an update disc

NOTE

- Recommended Application Program
  - Nero Burning / Easy CD Creator ..etc
- Option
  - Multisession : No Multisession
  - CD close & disc at once
  - ISO 9660 or joliet format
  - Extension name : “*.RUF”
- In order to increase disc playability, add a dummy file (over 100MB) together with the latest program. (The dummy file can be any kind of file except MP3 file etc which can be played in the unit and we recommend to use a file whose extension name as “*.dmy”, which can be changed from original one.)

WARNING

Very important : please read the notice below before updating your unit.

The followong events may interrupt the update process and MAY RESULT IN PERMANENT DAMAGE TO THE UNIT WHILE UPDATING

① Unplugging the power cord.
② Power Outage.
③ Dirt or Scratches on the disc.
④ Opening a disc tray during processing.

1) Press **OPEN/CLOSE** to open the disc tray.
2) Insert the update CD-R disc with the software update, label facing up.
3) Press **OPEN/CLOSE** to close the disc tray.

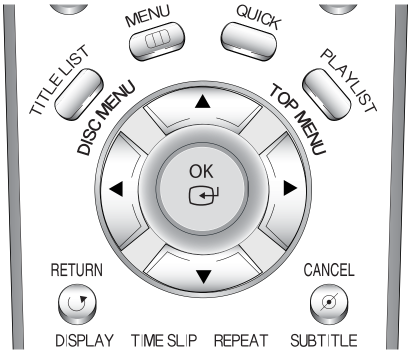
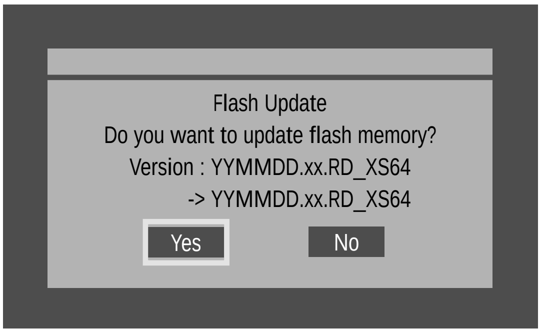


Fig. 3-7 Remote Control

Atfer checking old and new version, select “Yes” or “No” with “◀” or “▶” on the remote control.
* The Version is indicated by “YYMMDD.xx modelname”

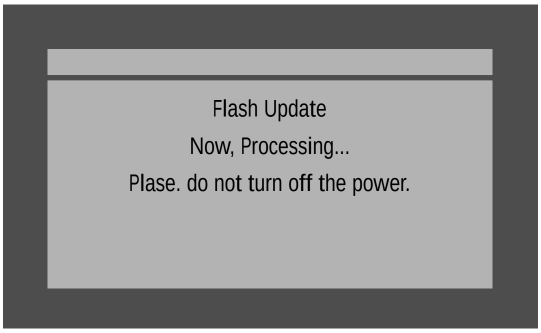


Flash Update
Do you want to update flash memory?
Version : YYMMDD.xx.RD_XS64
-> YYMMDD.xx.RD_XS64

Fig. 3-6

* If you don’t see the message above, try another disc.
Generally, this is caused by disc quality and by disc creating problem.

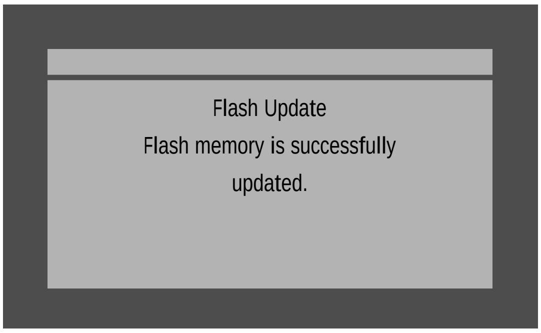
4) Press the **OK** button on the remote control (Fig. 3-7).



Flash Update
Now, Processing...
Plase. do not turn off the power.

Fig. 3-8

5) It takes about 5 minutes to complete the update.
The message below will be displayed in the screen after update is completed and the tray will open automatically.



Flash Update
Flash memory is successfully updated.

Fig. 3-9

* If the message to the left isn’t displayed after 10minutes and the unit is no longer functioning properly, contact a samsung authorized service center.

6) After removing the update disc, turn off the unit with power button.
Turn on the power again and the tray will then close.
The Flash update is now complete.

4. Disassembly and Reassembly

4-1 Cabinet and PCB

Note : Reassembly in reverse order.

4-1-1 Top Cabinet Removal

1) Remove 5 Screws ❶, ❷.
2) Lift up the Top Cabinet in direction of arrow.

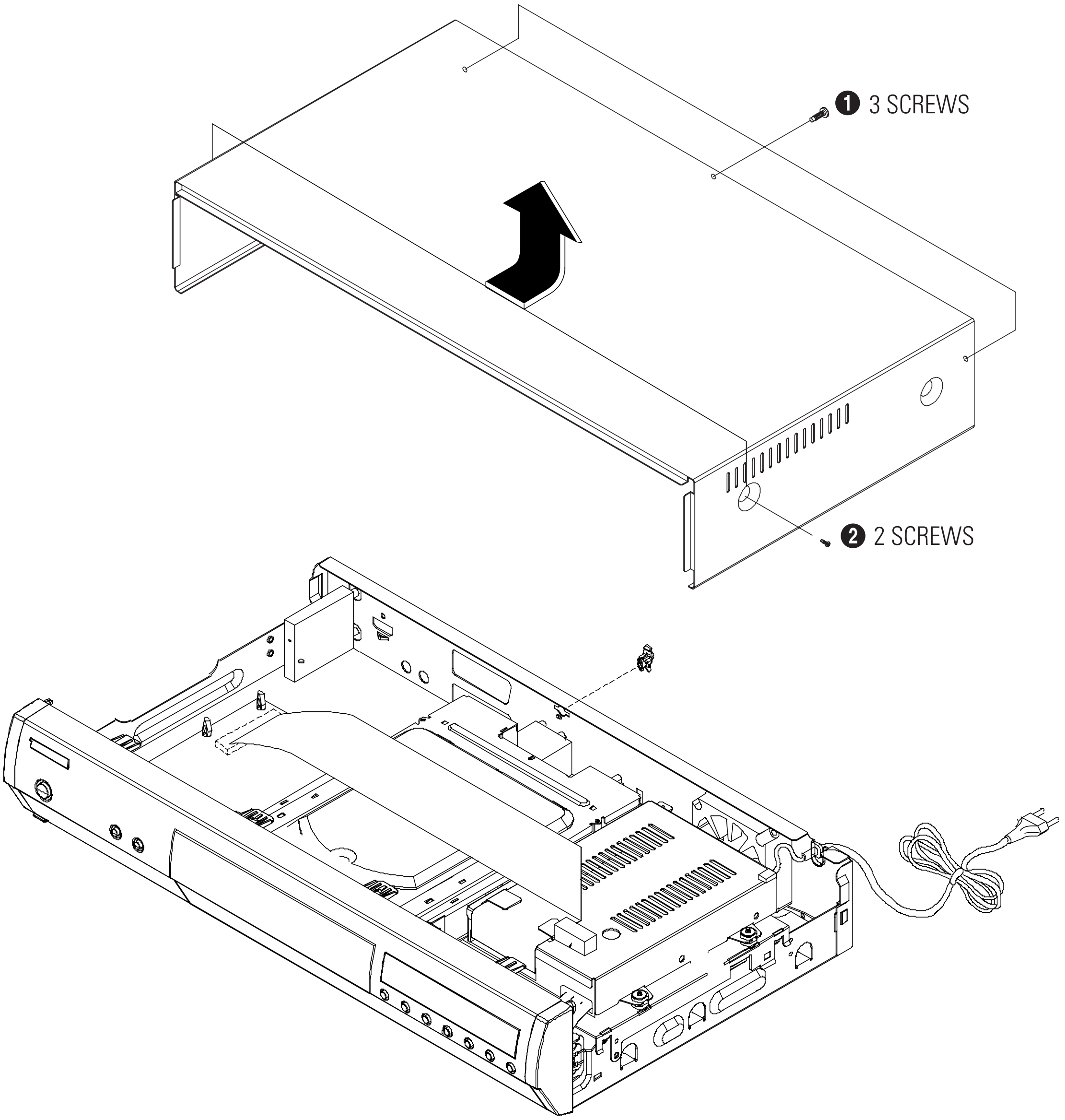


Fig. 4-1 Top Cabinet Removal

4-1-2 Ass'y Front-Cabinet Removal

1) Release 6 Hooks ❶, ❷, ❸, ❹ and Ass'y Front-Cabinet ❺.

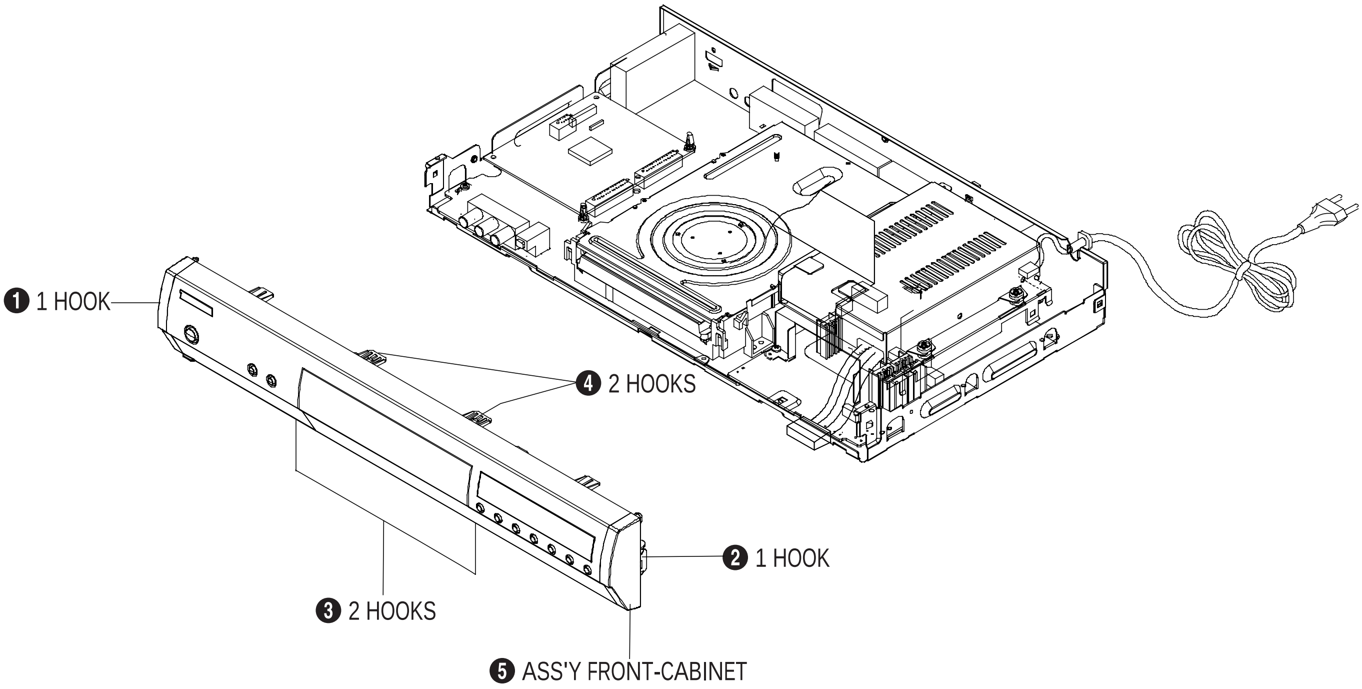

❶ 1 HOOK
❹ 2 HOOKS
❷ 1 HOOK
❸ 2 HOOKS
❺ ASS'Y FRONT-CABINET

Fig. 4-2 Ass'y Front-Cabinet Removal

4-1-3 HDMI PCB Removal

1) Remove 1 Screw ❶, from HDMI PCB ❷ and lift it up.

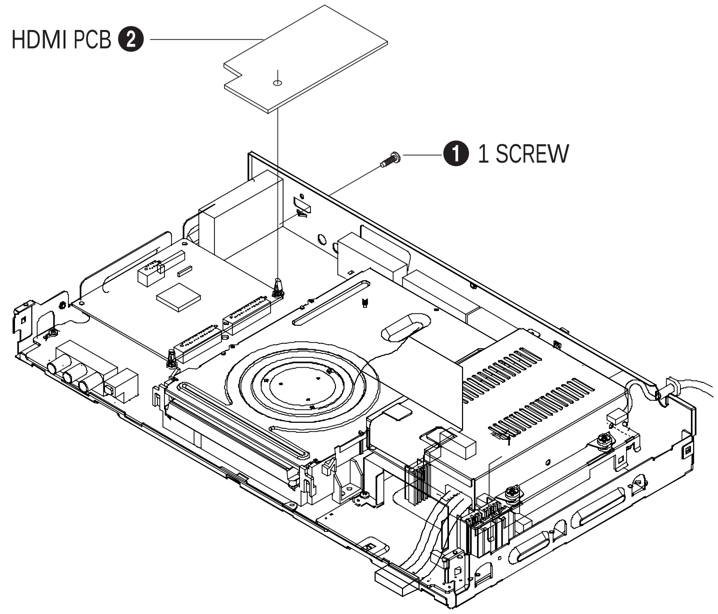

HDMI PCB ❷
❶ 1 SCREW

Fig. 4-3 HDMI PCB Removal

4-1-4 Hard Disk Removal

1) Remove 8 Screws ❶, ❷.

2) Remove 4 Screws ❸, ❹ from the Hard Disk ❺ and lift it up.

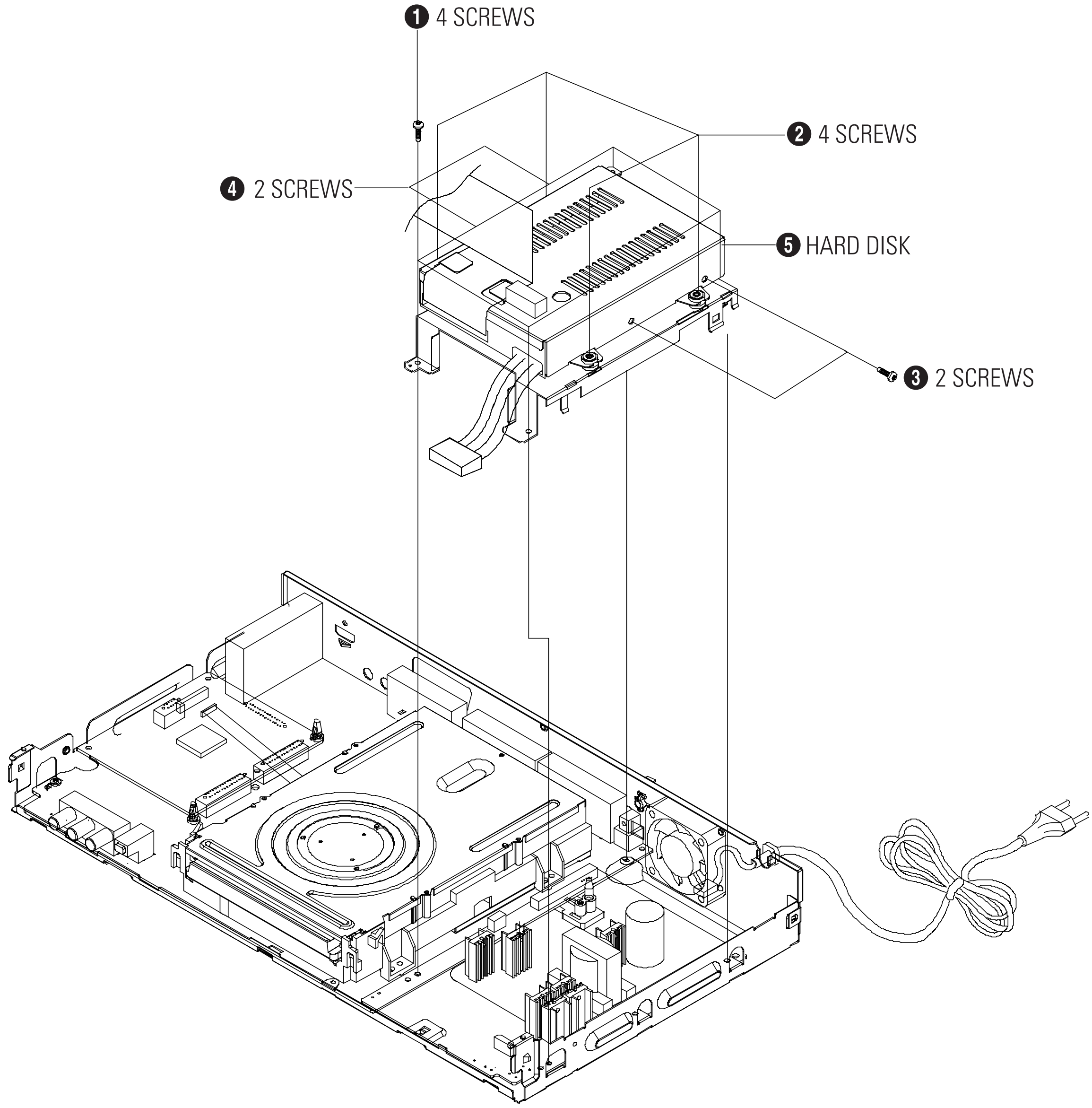

❶ 4 SCREWS
❷ 4 SCREWS
❹ 2 SCREWS
❺ HARD DISK
❸ 2 SCREWS

Fig. 4-4 Hard Disk Removal

4-1-5 Ass'y Deck, Main PCB and S.M.P.S. PCB Removal

1) Remove 4 Screws ❶, ❷ from the Ass'y Deck and lift it up.
2) Remove 2 Screws ❸ from the Main PCB ❹ and lift it up.
3) Remove 2 Screws ❺, ❻ from the S.M.P.S. PCB ❼ and lift it up.

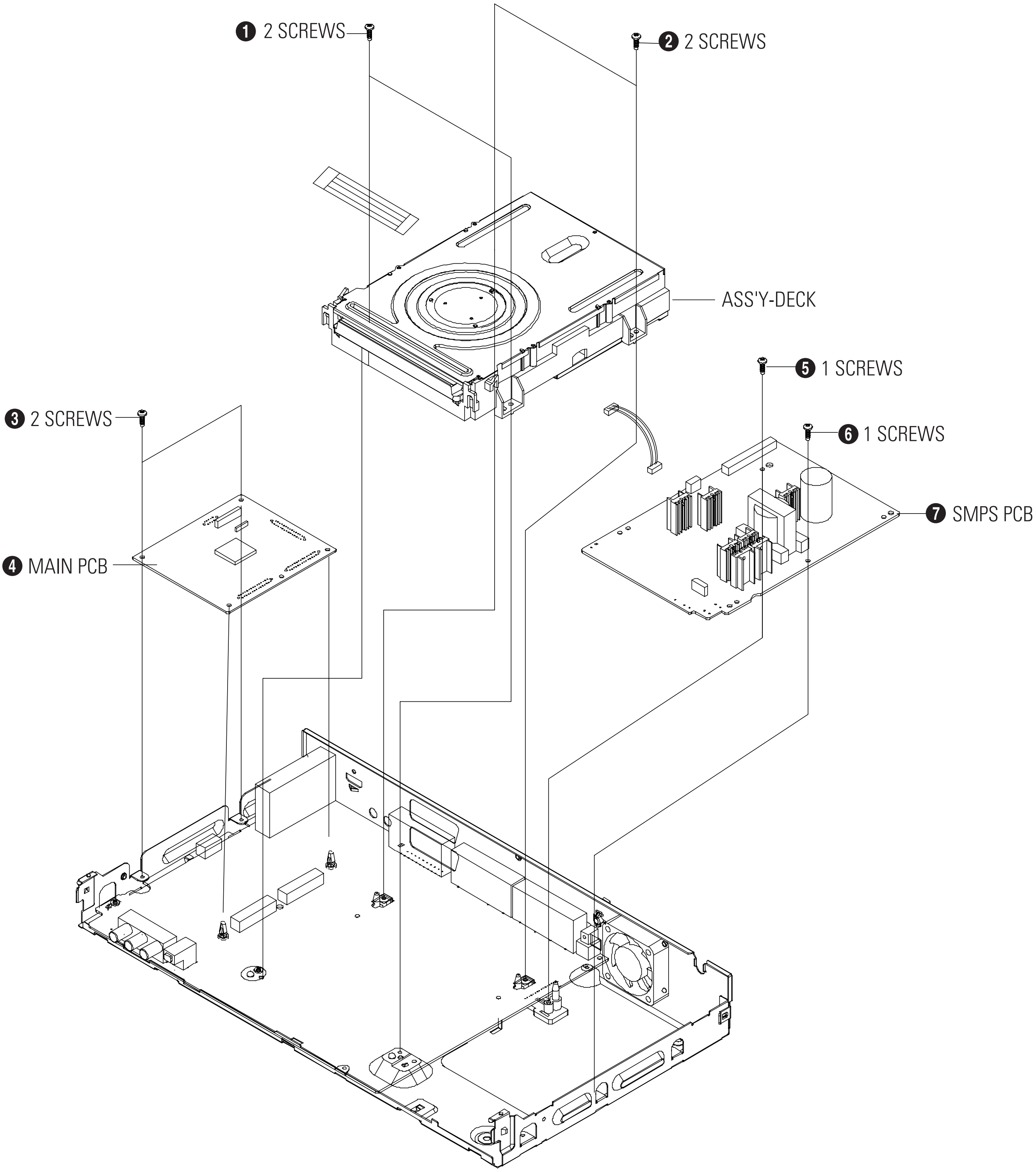

❶ 2 SCREWS
❷ 2 SCREWS
ASS'Y-DECK
❺ 1 SCREWS
❸ 2 SCREWS
❻ 1 SCREWS
❼ SMPS PCB
❹ MAIN PCB

Fig. 4-5 Ass'y Deck, Main PCB and S.M.P.S. PCB Removal

4-1-6 Jack PCB Removal

1) Remove 4 Screws ❶, ❷, from the Jack PCB ❸ and lift it up.

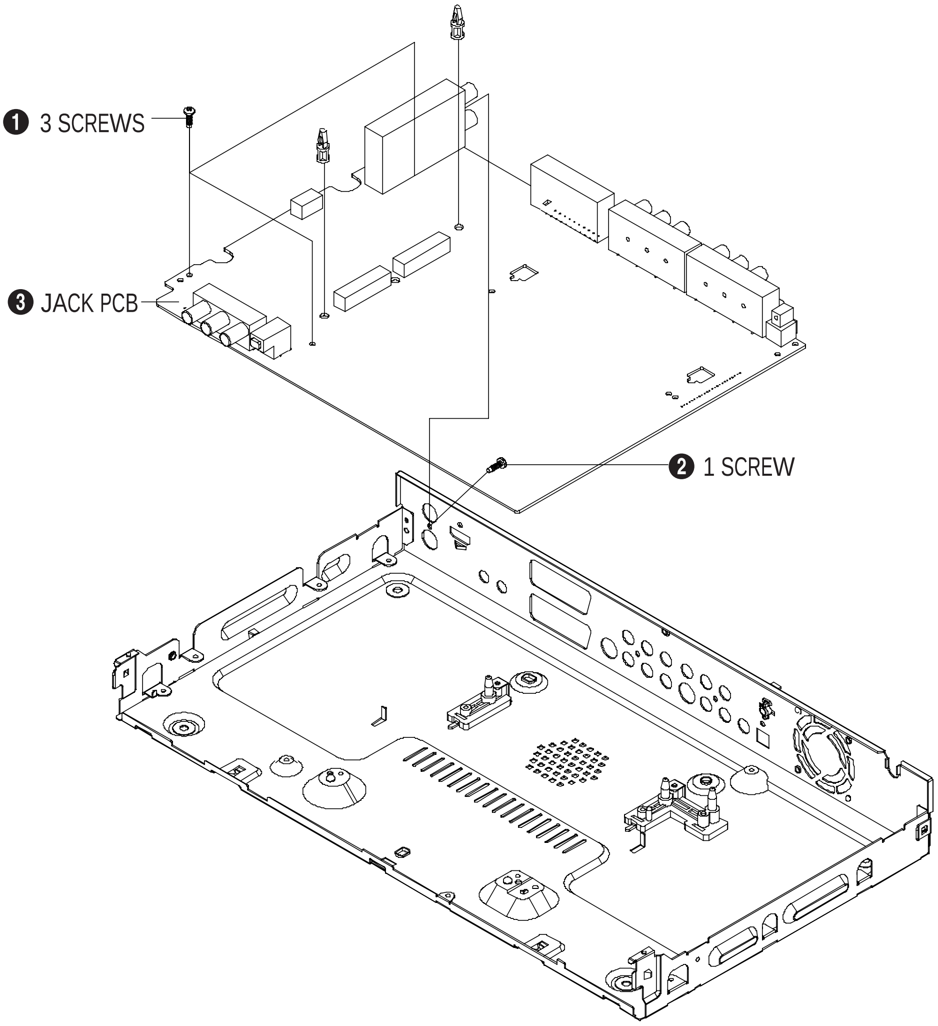

❶ 3 SCREWS
❸ JACK PCB
❷ 1 SCREW

Fig. 4-6 Jack PCB Removal

4-1-7 DC FAN Removal

1) Remove 2 Screws ❶, from the DC Fan ❷ and lift it up.

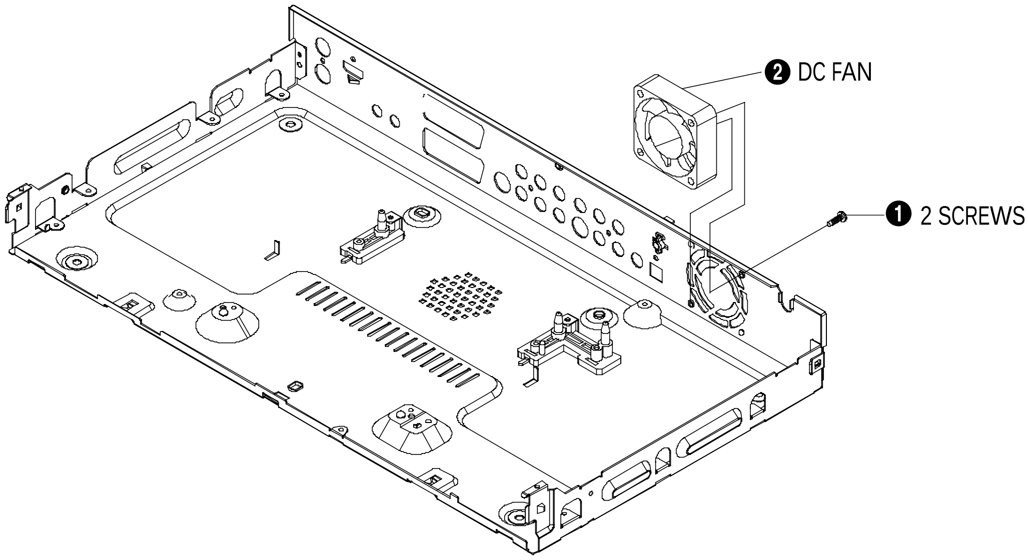

❷ DC FAN
❶ 2 SCREWS

Fig. 4-7 DC FAN Removal

4-2 PCB Location

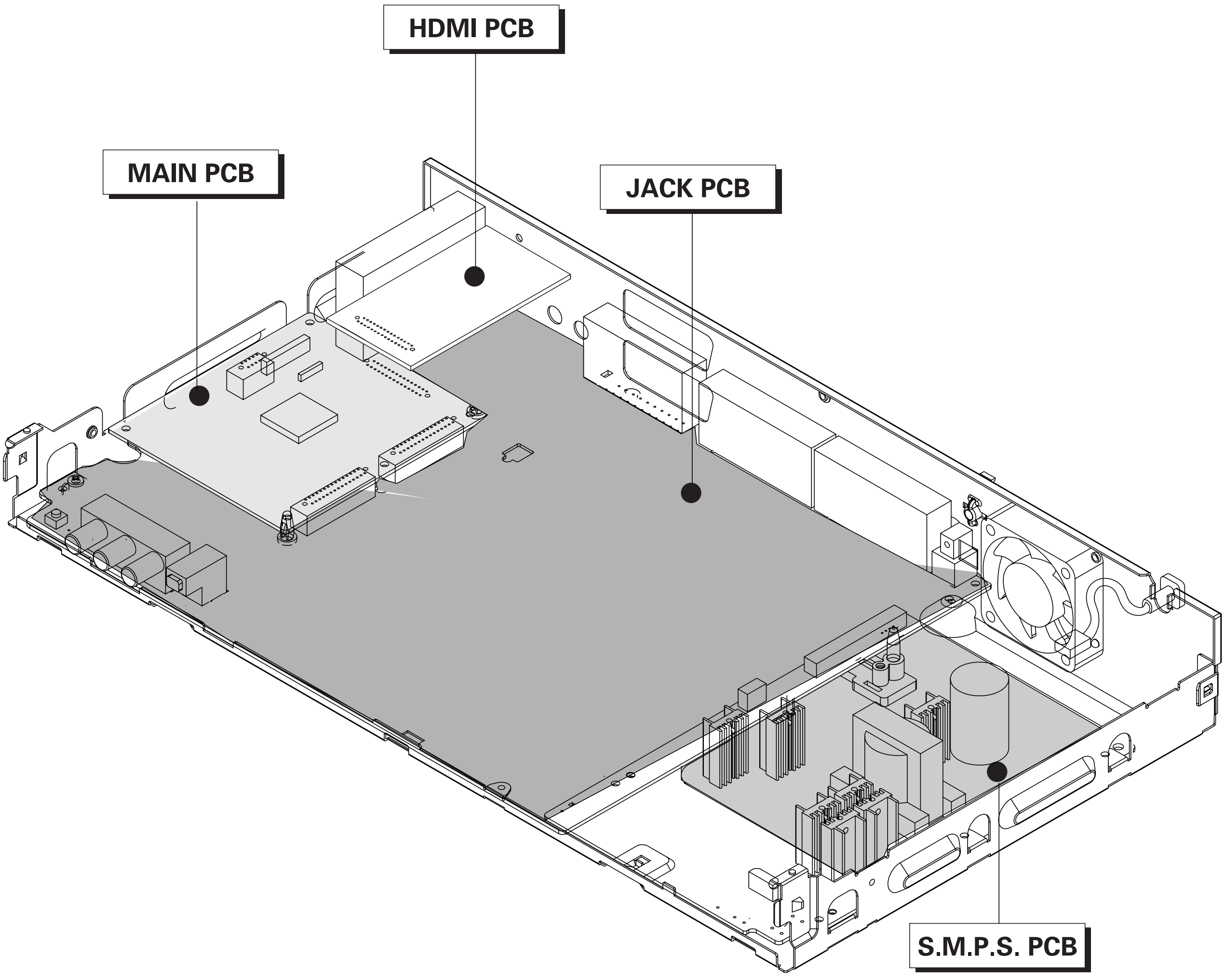
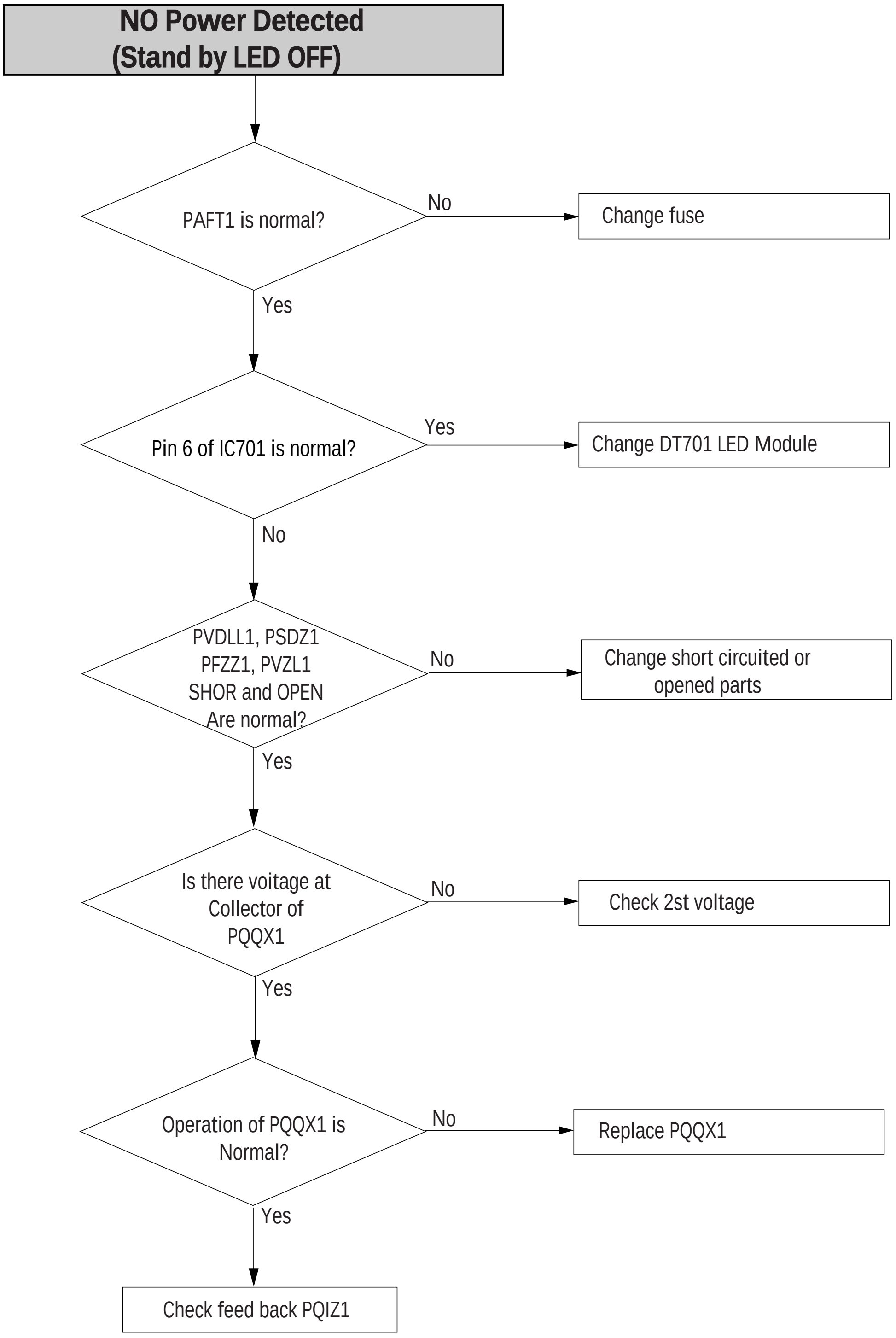
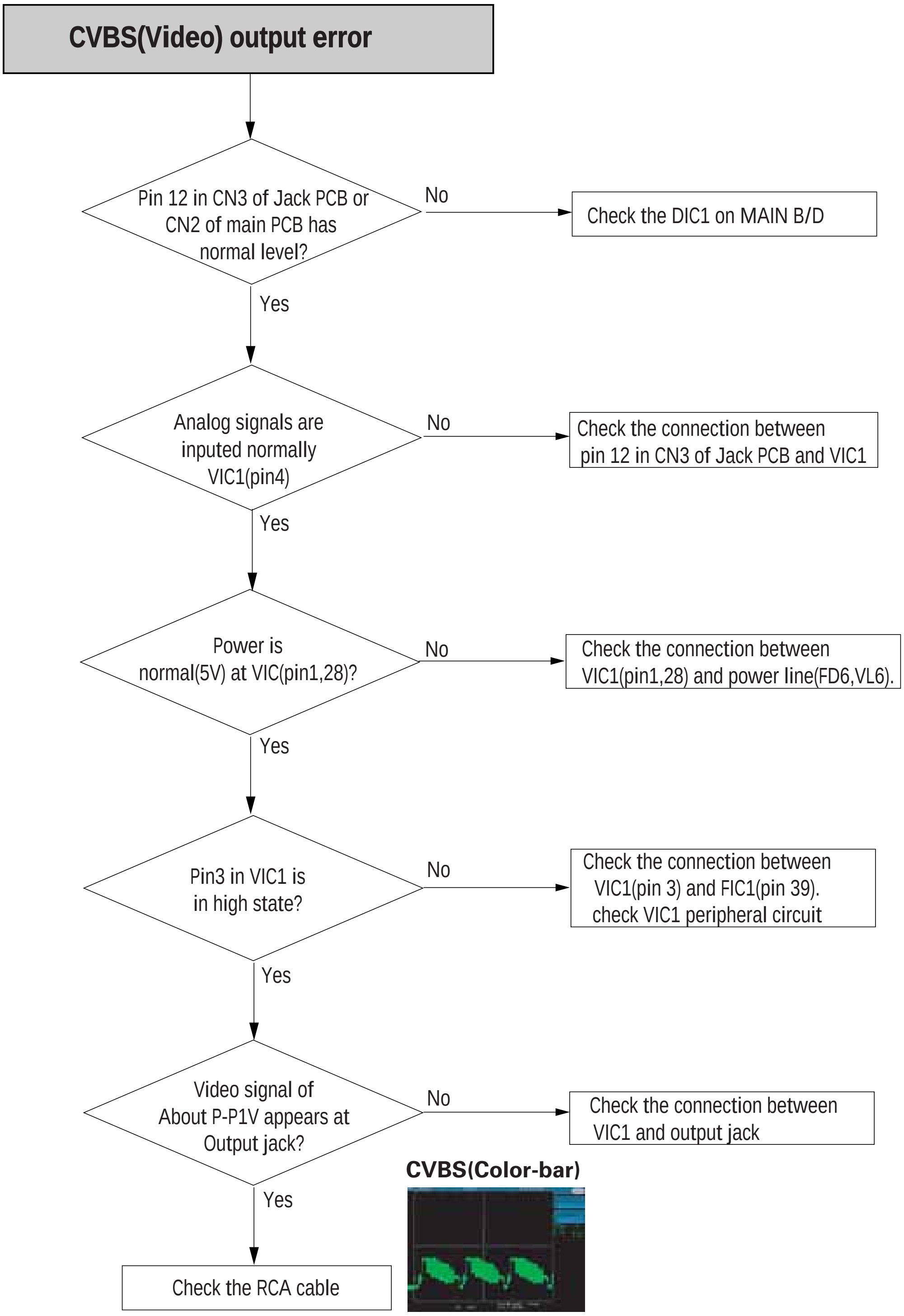

HDMI PCB
MAIN PCB
JACK PCB
S.M.P.S. PCB

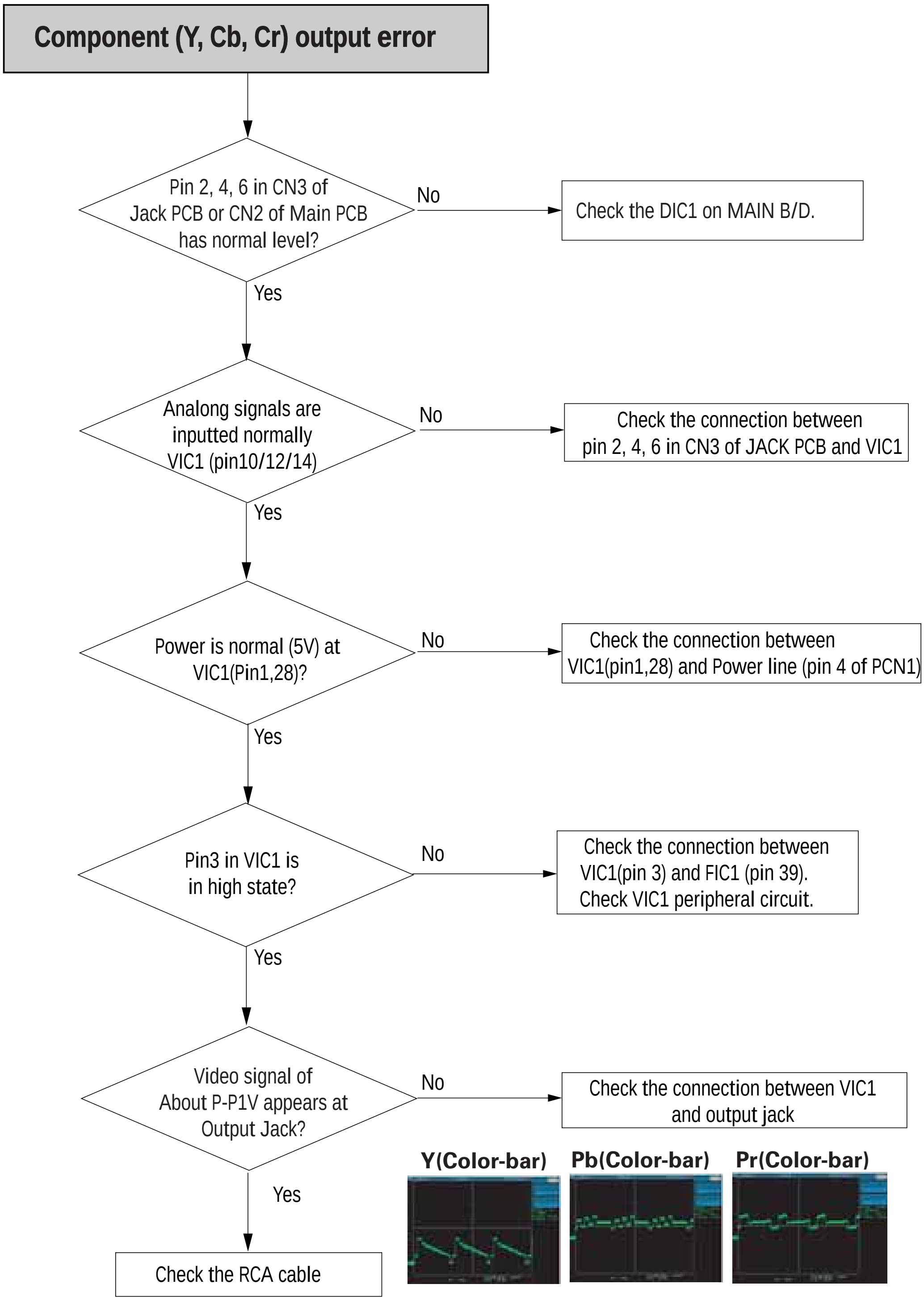
Fig. 4-8 PCB Location

5. Troubleshooting

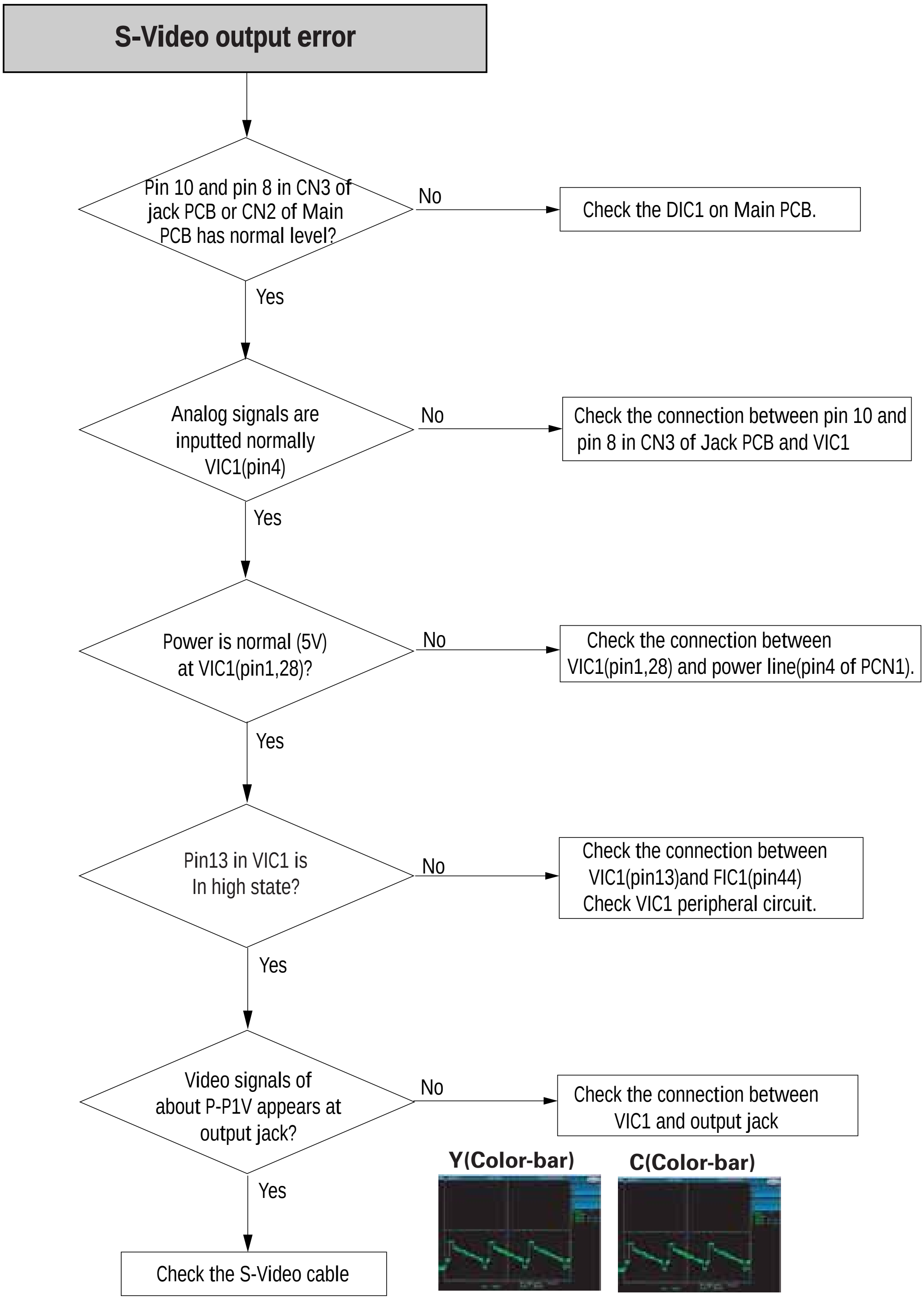

NO Power Detected
(Stand by LED OFF)
PAFT1 is normal?
No
Change fuse
Yes
Pin 6 of IC701 is normal?
Yes
Change DT701 LED Module
No
PVDLL1, PSDZ1
PFZZ1, PVZL1
SHOR and OPEN
Are normal?
No
Change short circuited or opened parts
Yes
Is there voitage at Collector of PQQX1
No
Check 2st voltage
Yes
Operation of PQQX1 is Normal?
No
Replace PQQX1
Yes
Check feed back PQIZ1

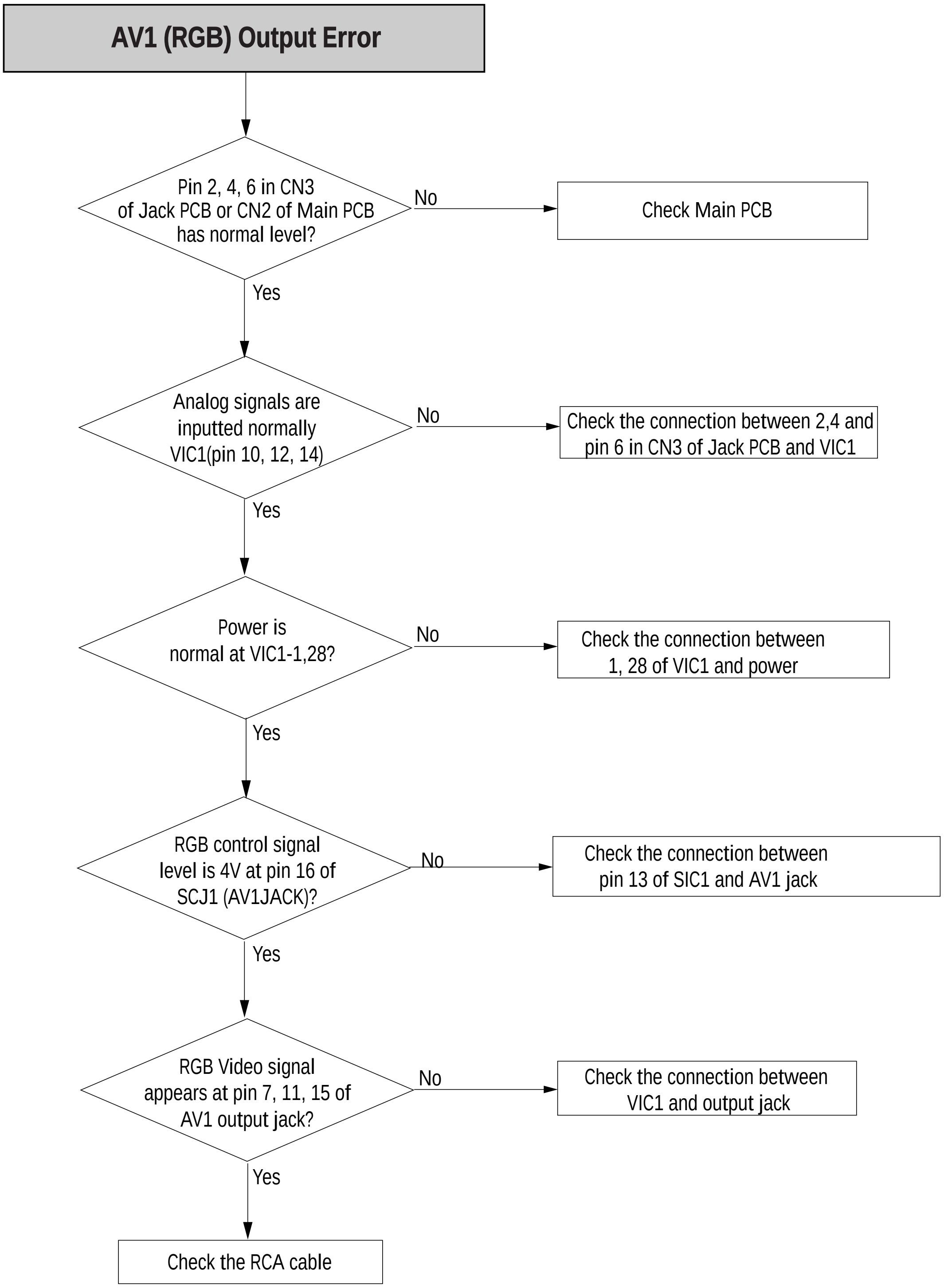

CVBS(Video) output error
Pin 12 in CN3 of Jack PCB or CN2 of main PCB has normal level?
No
Check the DIC1 on MAIN B/D
Yes
Analog signals are inputed normally VIC1(pin4)
No
Check the connection between pin 12 in CN3 of Jack PCB and VIC1
Yes
Power is normal(5V) at VIC(pin1,28)?
No
Check the connection between VIC1(pin1,28) and power line(FD6,VL6).
Yes
Pin3 in VIC1 is in high state?
No
Check the connection between VIC1(pin 3) and FIC1(pin 39). check VIC1 peripheral circuit
Yes
Video signal of About P-P1V appears at Output jack?
No
Check the connection between VIC1 and output jack
CVBS(Color-bar)
Yes
Check the RCA cable

# IF Recorder is under PSO(progressive scan output) MODE, it does not output the CVBS& S-Video, RGB signal.

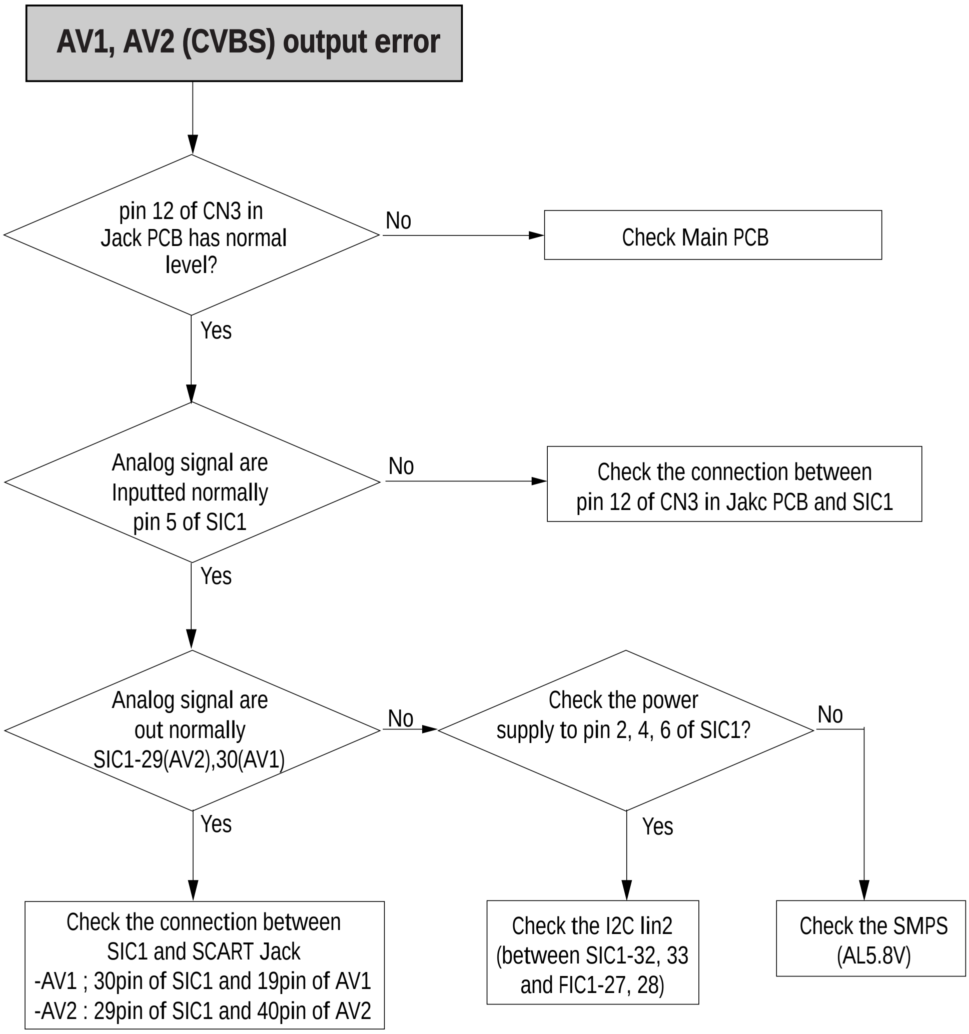

Component (Y, Cb, Cr) output error
Pin 2, 4, 6 in CN3 of Jack PCB or CN2 of Main PCB has normal level?
No
Check the DIC1 on MAIN B/D.
Yes
Analong signals are inputted normally VIC1 (pin10/12/14)
No
Check the connection between pin 2, 4, 6 in CN3 of JACK PCB and VIC1
Yes
Power is normal (5V) at VIC1(Pin1,28)?
No
Check the connection between VIC1(pin1,28) and Power line (pin 4 of PCN1)
Yes
Pin3 in VIC1 is in high state?
No
Check the connection between VIC1(pin 3) and FIC1 (pin 39). Check VIC1 peripheral circuit.
Yes
Video signal of About P-P1V appears at Output Jack?
No
Check the connection between VIC1 and output jack
Yes
Check the RCA cable
Y(Color-bar)
Pb(Color-bar)
Pr(Color-bar)

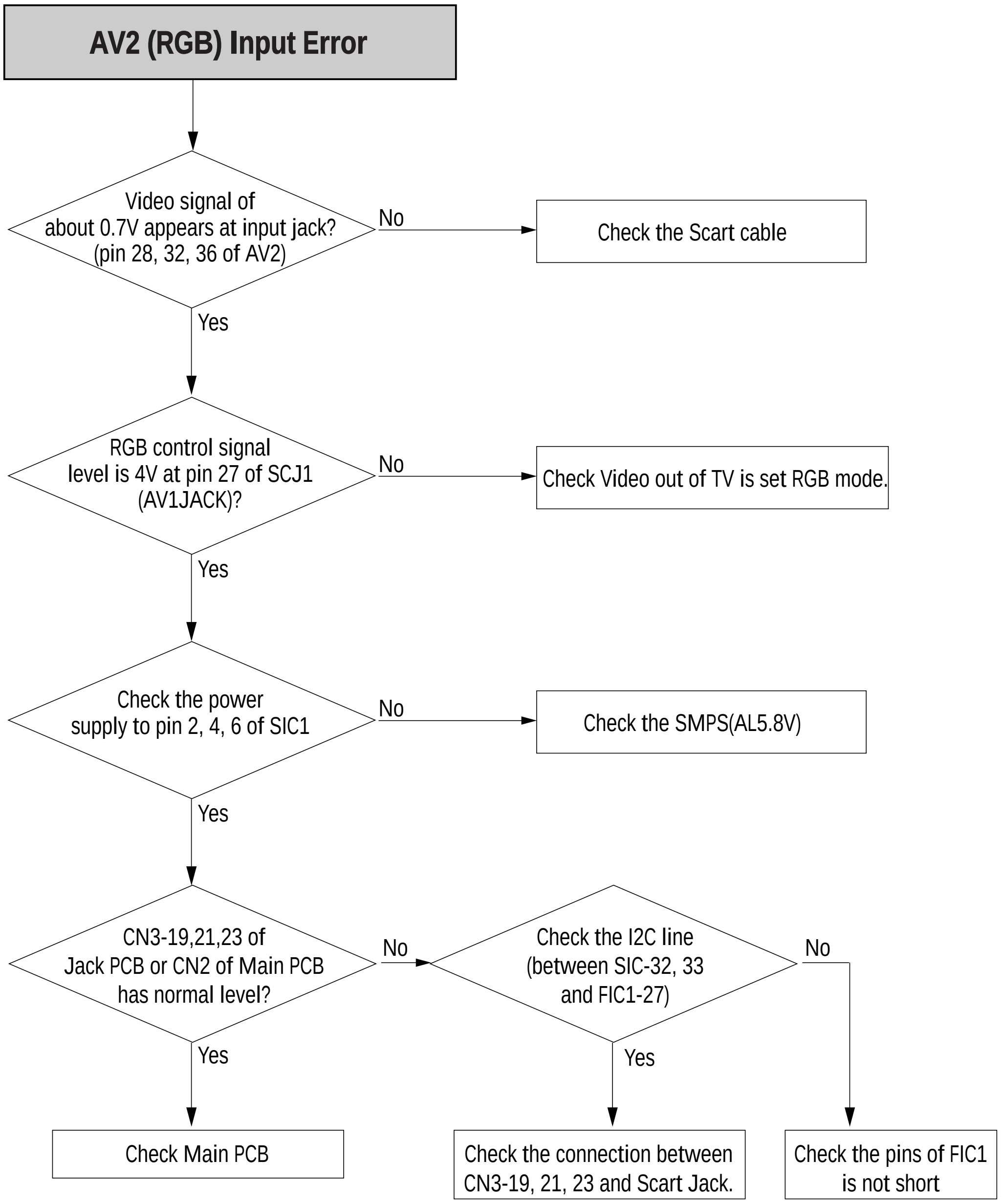
# IF Recorder is under PSO(progressive scan output) MODE, or it does not output the CVBS& S-Video signal.


S-Video output error
Pin 10 and pin 8 in CN3 of jack PCB or CN2 of Main PCB has normal level?
No
Check the DIC1 on Main PCB.
Yes
Analog signals are inputted normally VIC1(pin4)
No
Check the connection between pin 10 and pin 8 in CN3 of Jack PCB and VIC1
Yes
Power is normal (5V) at VIC1(pin1,28)?
No
Check the connection between VIC1(pin1,28) and power line(pin4 of PCN1).
Yes
Pin13 in VIC1 is In high state?
No
Check the connection between VIC1(pin13)and FIC1(pin44) Check VIC1 peripheral circuit.
Yes
Video signals of about P-P1V appears at output jack?
No
Check the connection between VIC1 and output jack
Yes
Check the S-Video cable
Y(Color-bar)
C(Color-bar)

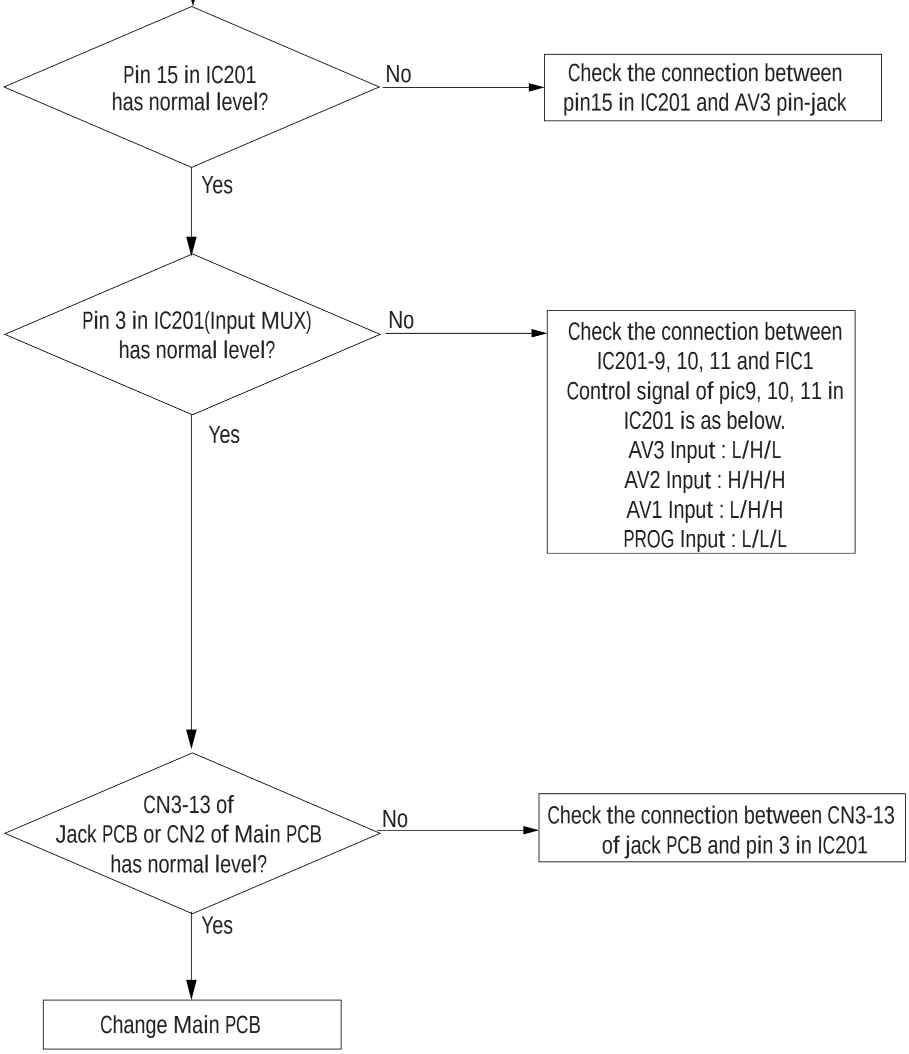

AV1 (RGB) Output Error
Pin 2, 4, 6 in CN3 of Jack PCB or CN2 of Main PCB has normal level?
No
Check Main PCB
Yes
Analog signals are inputted normally VIC1(pin 10, 12, 14)
No
Check the connection between 2,4 and pin 6 in CN3 of Jack PCB and VIC1
Yes
Power is normal at VIC1-1,28?
No
Check the connection between 1, 28 of VIC1 and power
Yes
RGB control signal level is 4V at pin 16 of SCJ1 (AV1JACK)?
No
Check the connection between pin 13 of SIC1 and AV1 jack
Yes
RGB Video signal appears at pin 7, 11, 15 of AV1 output jack?
No
Check the connection between VIC1 and output jack
Yes
Check the RCA cable

# IF Recorder is under Component mode (in OSD setup menu),
it does not output RGB out put.

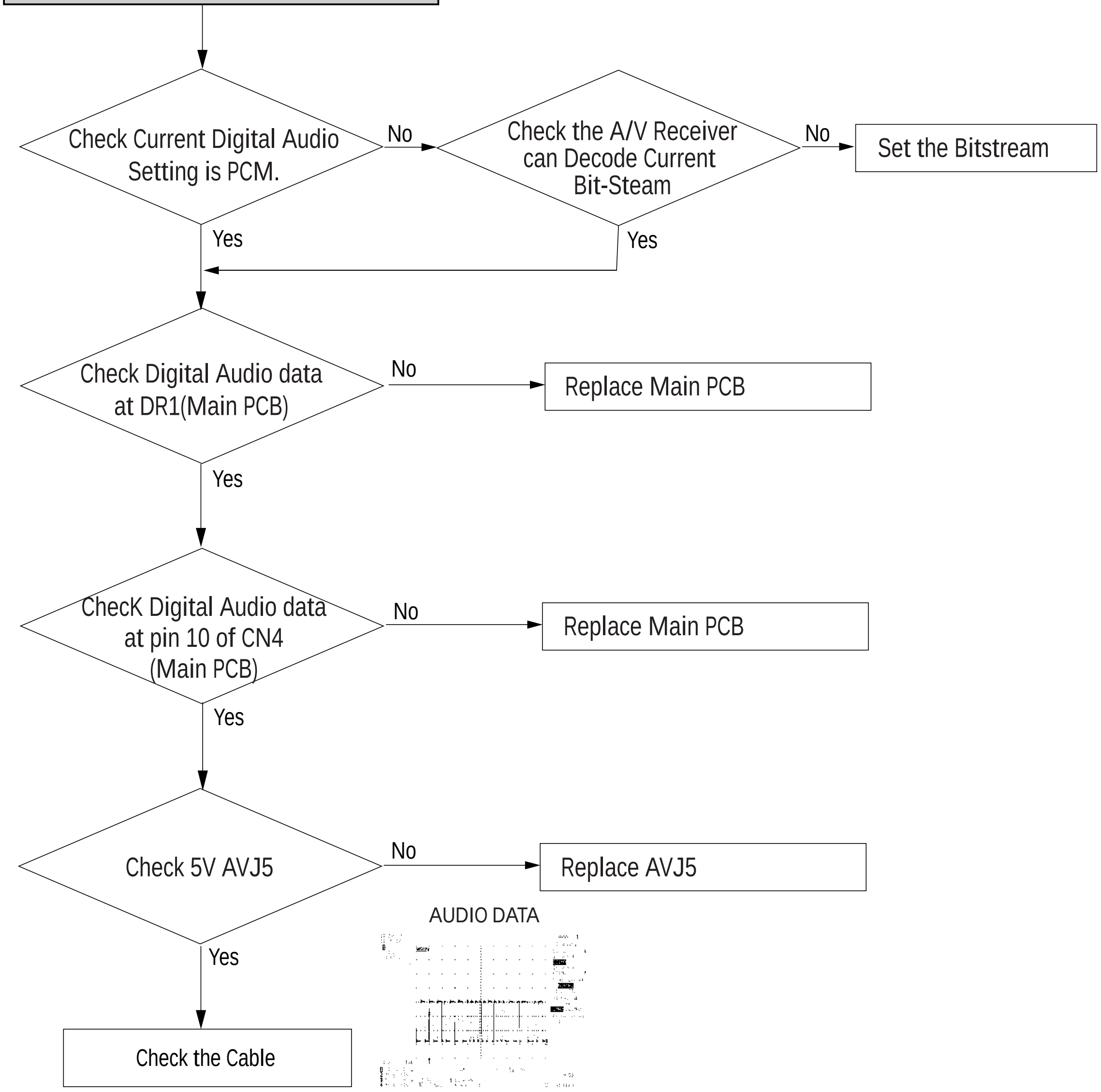

AV1, AV2 (CVBS) output error
pin 12 of CN3 in Jack PCB has normal level?
No
Check Main PCB
Yes
Analog signal are Inputted normally pin 5 of SIC1
No
Check the connection between pin 12 of CN3 in Jakc PCB and SIC1
Yes
Analog signal are out normally SIC1-29(AV2),30(AV1)
No
Check the power supply to pin 2, 4, 6 of SIC1?
No
Yes
Yes
Check the connection between SIC1 and SCART Jack
-AV1 ; 30pin of SIC1 and 19pin of AV1
-AV2 : 29pin of SIC1 and 40pin of AV2
Check the I2C lin2 (between SIC1-32, 33 and FIC1-27, 28)
Check the SMPS (AL5.8V)

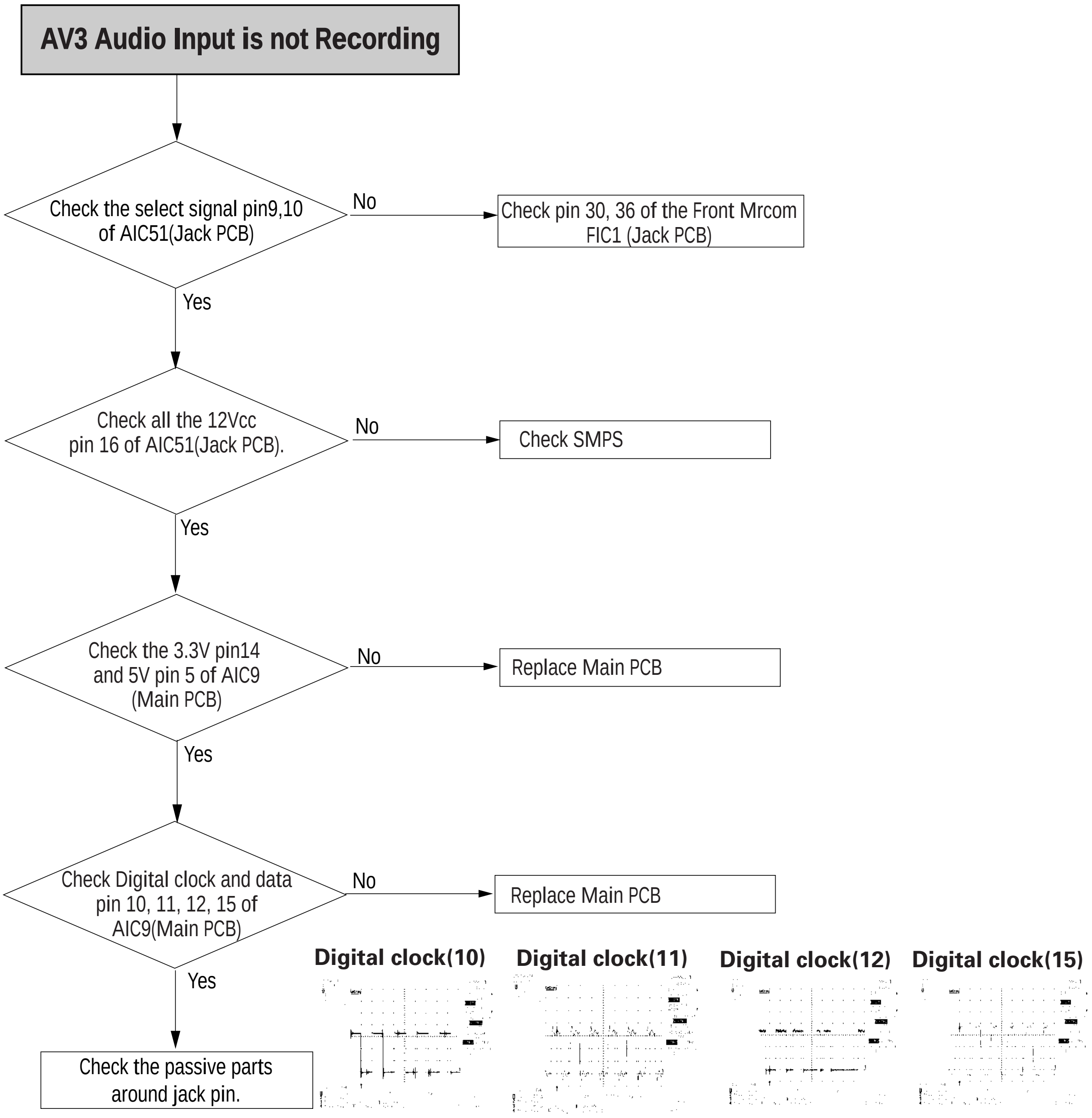

AV2 (RGB) Input Error
Video signal of about 0.7V appears at input jack? (pin 28, 32, 36 of AV2)
No
Check the Scart cable
Yes
RGB control signal level is 4V at pin 27 of SCJ1 (AV1JACK)?
No
Check Video out of TV is set RGB mode.
Yes
Check the power supply to pin 2, 4, 6 of SIC1
No
Check the SMPS(AL5.8V)
Yes
CN3-19,21,23 of Jack PCB or CN2 of Main PCB has normal level?
No
Check the I2C line (between SIC-32, 33 and FIC1-27)
No
Yes
Check Main PCB
Yes
Check the connection between CN3-19, 21, 23 and Scart Jack.
Check the pins of FIC1 is not short

AV3 CVBS Video Input Error

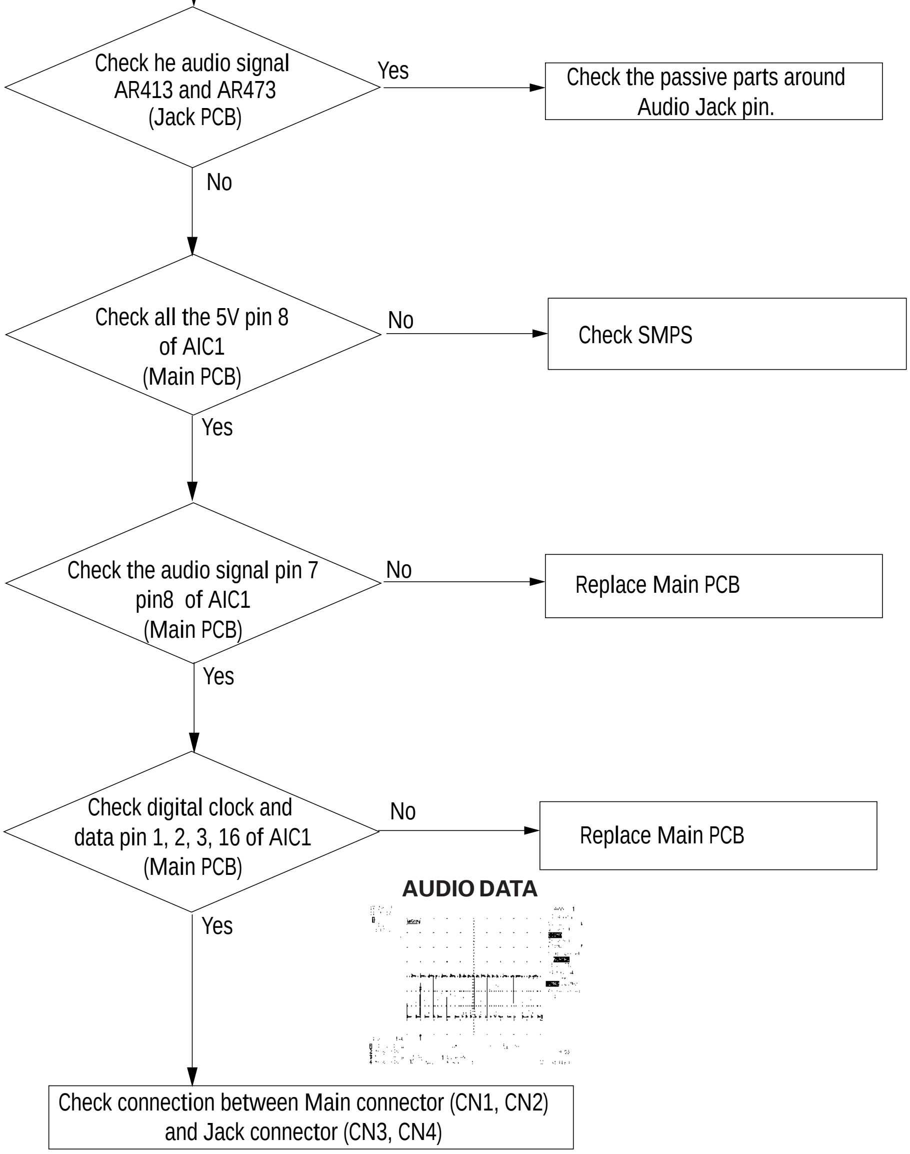

Pin 15 in IC201
has normal level?
No
Check the connection between
pin15 in IC201 and AV3 pin-jack
Yes
Pin 3 in IC201(Input MUX)
has normal level?
No
Check the connection between
IC201-9, 10, 11 and FIC1
Control signal of pic9, 10, 11 in
IC201 is as below.
AV3 Input : L/H/L
AV2 Input : H/H/H
AV1 Input : L/H/H
PROG Input : L/L/L
Yes
CN3-13 of
Jack PCB or CN2 of Main PCB
has normal level?
No
Check the connection between CN3-13
of jack PCB and pin 3 in IC201
Yes
Change Main PCB

There's no Digital Audio Out

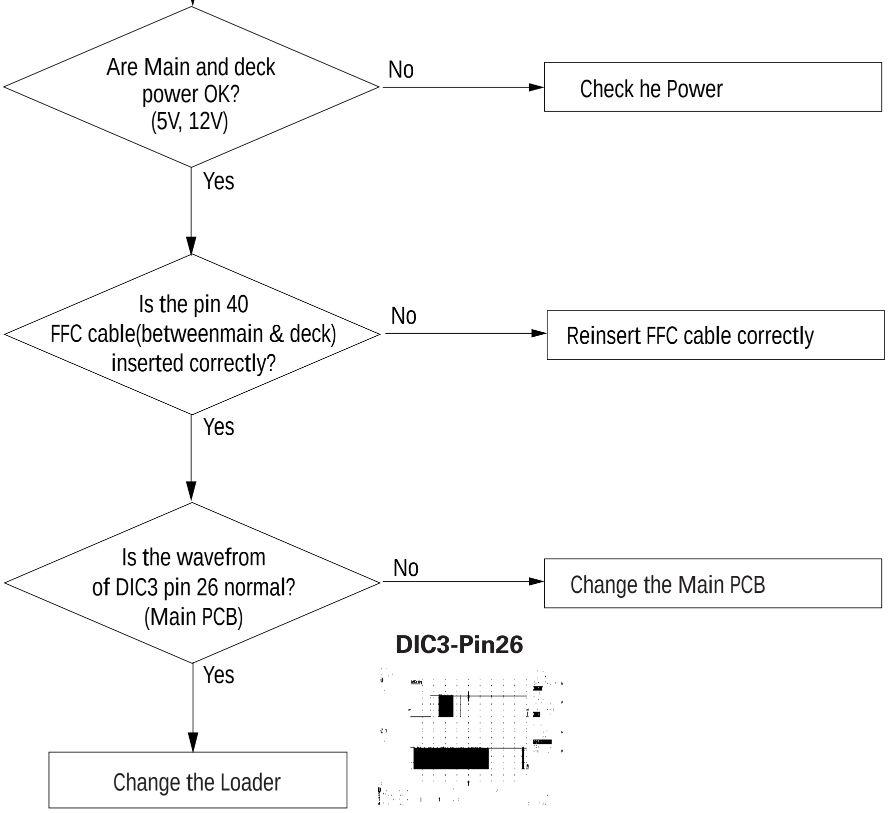

Check Current Digital Audio Setting is PCM.
No
Check the A/V Receiver can Decode Current Bit-Steam
No
Set the Bitstream
Yes
Yes
Check Digital Audio data at DR1(Main PCB)
No
Replace Main PCB
Yes
ChecK Digital Audio data at pin 10 of CN4 (Main PCB)
No
Replace Main PCB
Yes
Check 5V AVJ5
No
Replace AVJ5
AUDIO DATA
Yes
Check the Cable


AV3 Audio Input is not Recording
Check the select signal pin9,10 of AIC51(Jack PCB)
No
Check pin 30, 36 of the Front Mrcom FIC1 (Jack PCB)
Yes
Check all the 12Vcc pin 16 of AIC51(Jack PCB).
No
Check SMPS
Yes
Check the 3.3V pin14 and 5V pin 5 of AIC9 (Main PCB)
No
Replace Main PCB
Yes
Check Digital clock and data pin 10, 11, 12, 15 of AIC9(Main PCB)
No
Replace Main PCB
Yes
Check the passive parts around jack pin.
Digital clock(10)
Digital clock(11)
Digital clock(12)
Digital clock(15)

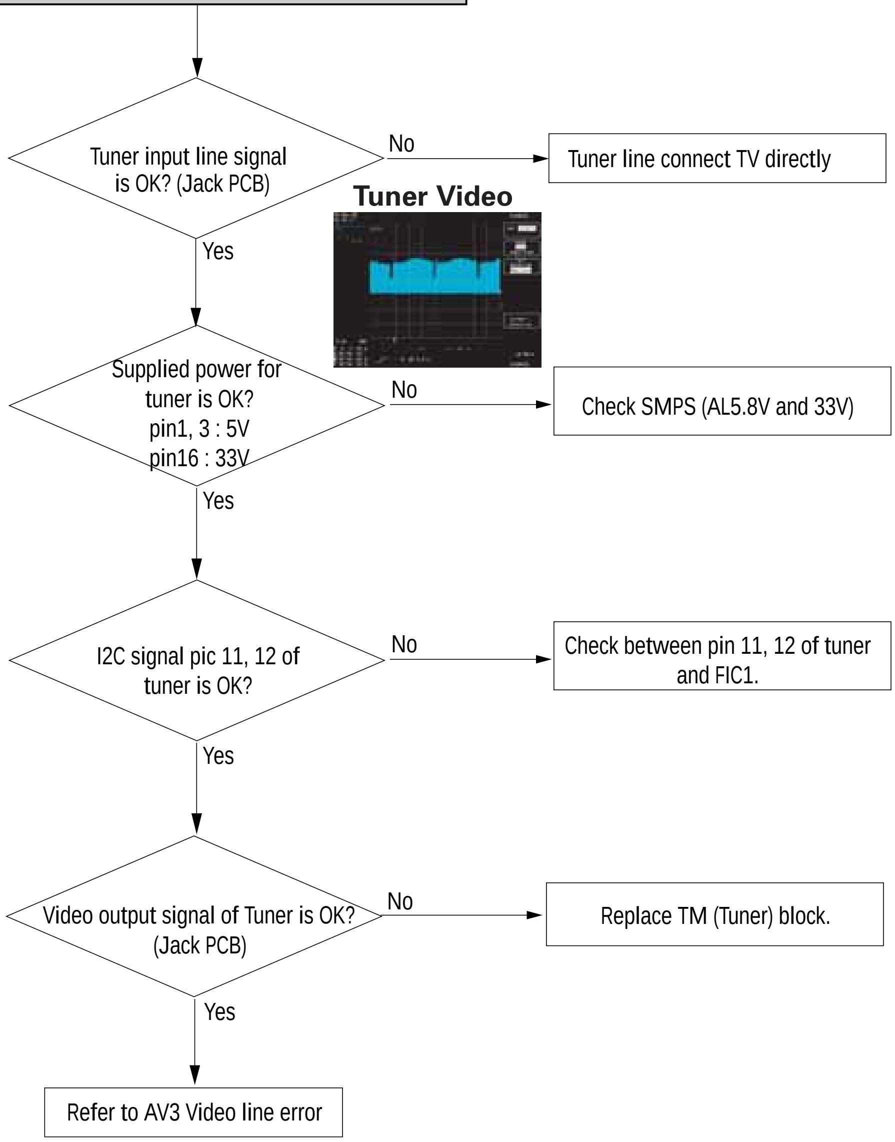
There is no Audio Output

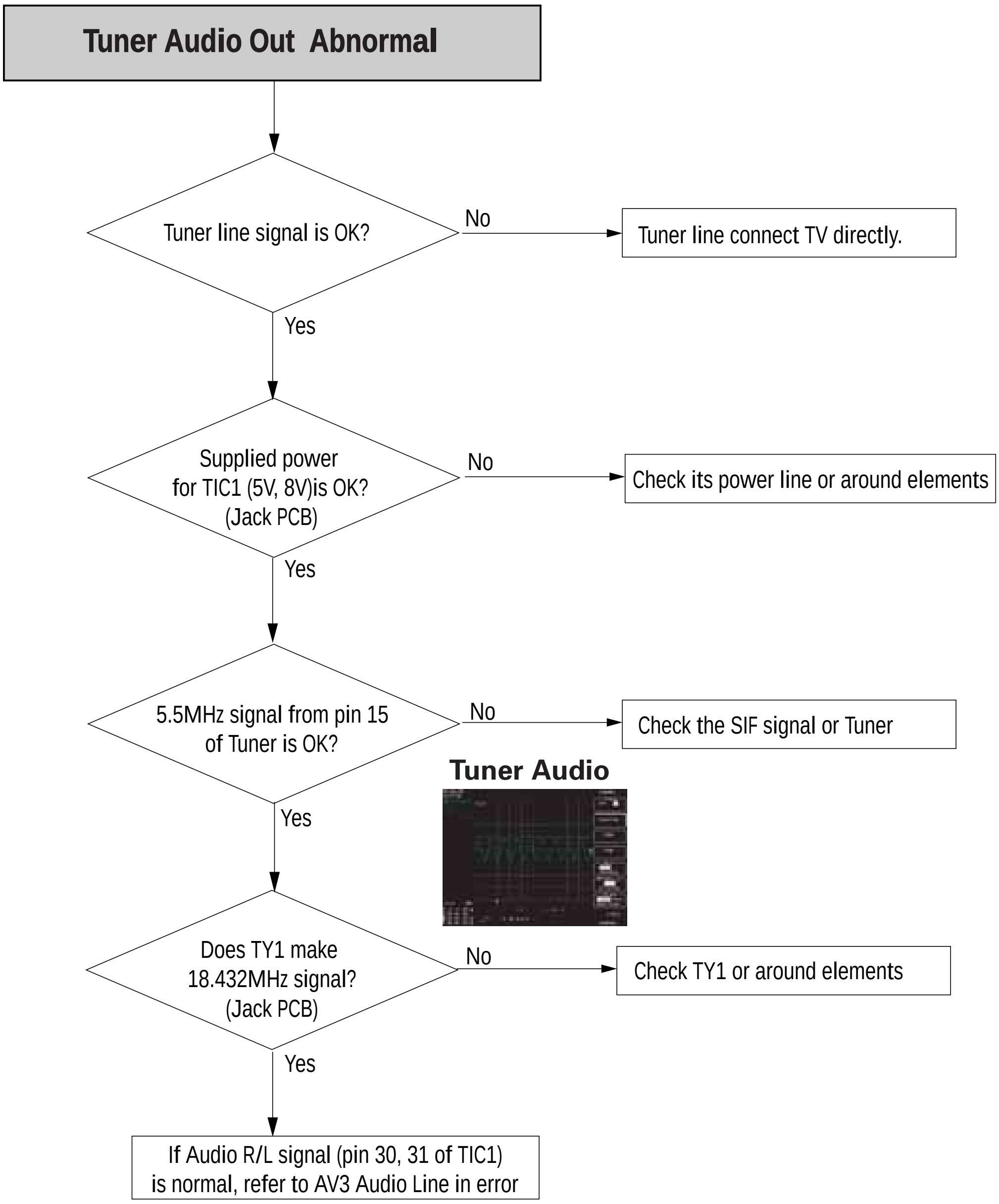

Check he audio signal
AR413 and AR473
(Jack PCB)
Yes
Check the passive parts around Audio Jack pin.
No
Check all the 5V pin 8
of AIC1
(Main PCB)
No
Check SMPS
Yes
Check the audio signal pin 7
pin8 of AIC1
(Main PCB)
No
Replace Main PCB
Yes
Check digital clock and
data pin 1, 2, 3, 16 of AIC1
(Main PCB)
No
Replace Main PCB
AUDIO DATA
Yes
Check connection between Main connector (CN1, CN2)
and Jack connector (CN3, CN4)

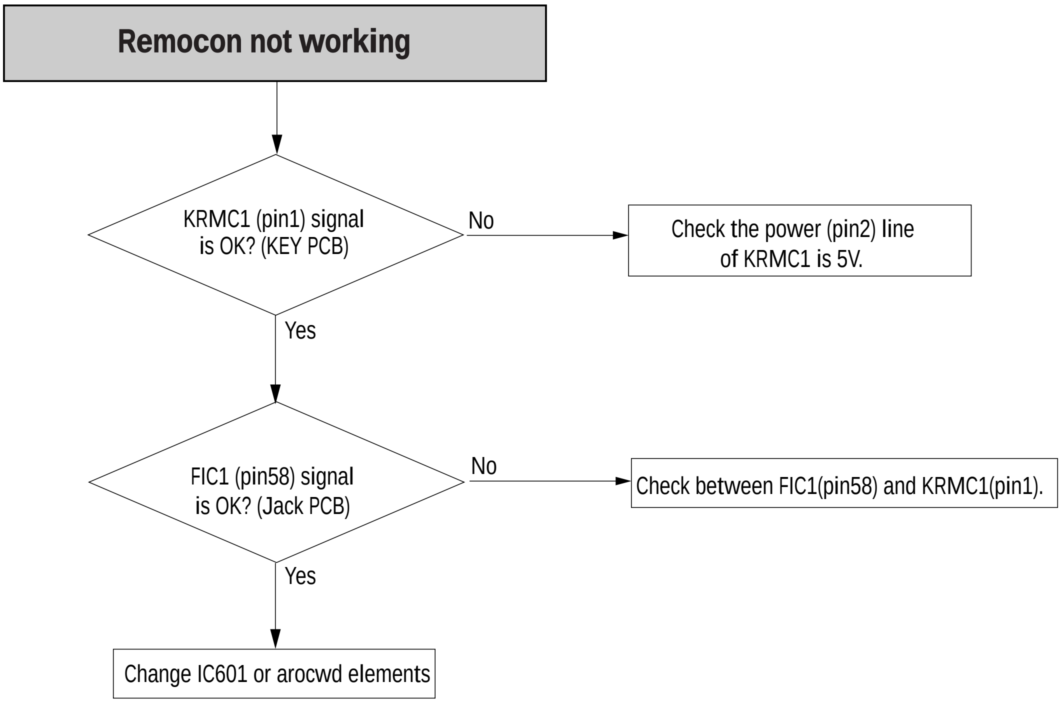
Disc loading error


Are Main and deck
power OK?
(5V, 12V)
No
Check he Power
Yes
Is the pin 40
FFC cable(betweenmain & deck)
inserted correctly?
No
Reinsert FFC cable correctly
Yes
Is the wavefrom
of DIC3 pin 26 normal?
(Main PCB)
No
Change the Main PCB
DIC3-Pin26
Yes
Change the Loader

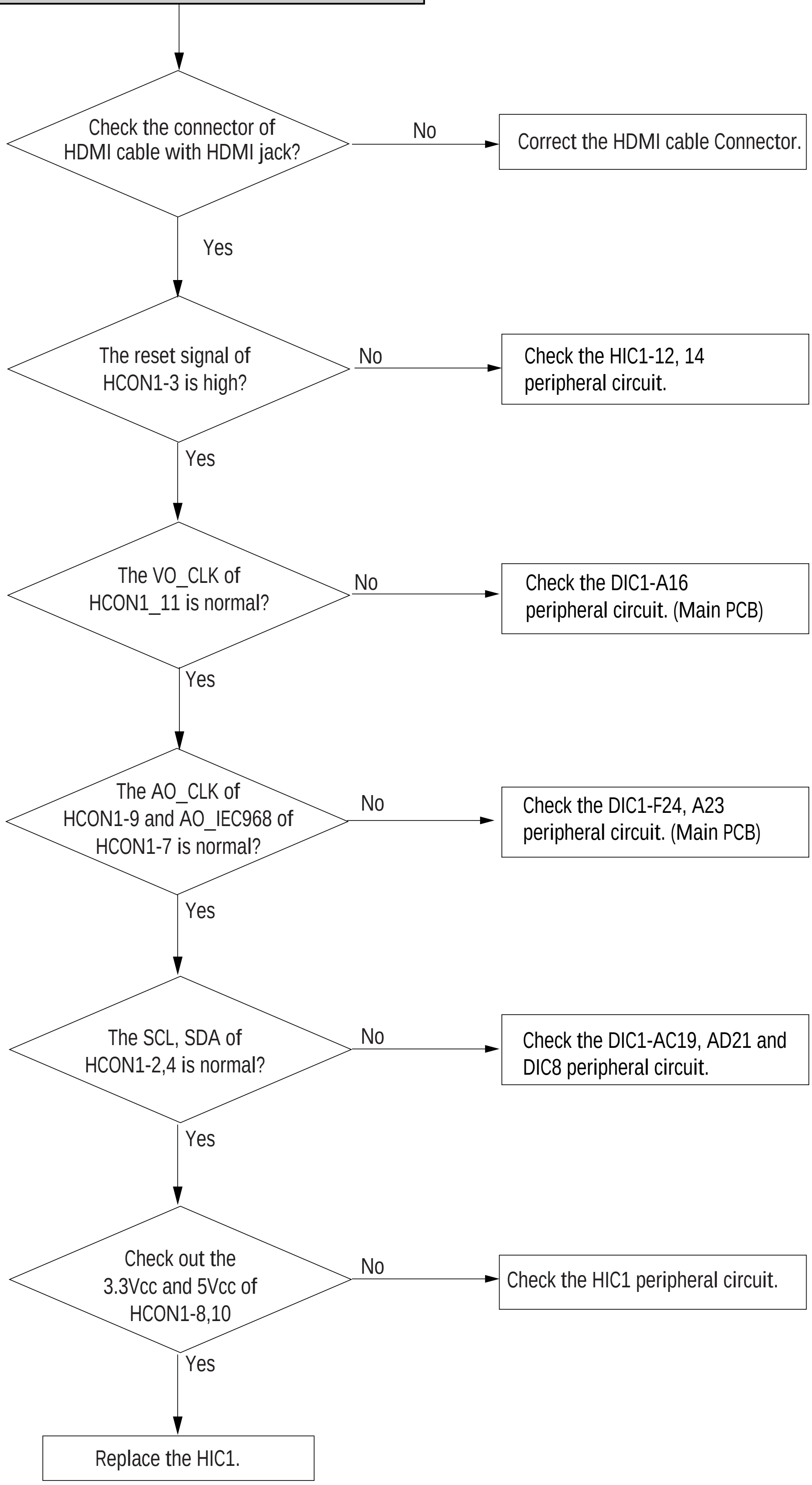
Tuner Video Out Abnormal


Tuner input line signal is OK? (Jack PCB)
No
Tuner line connect TV directly
Yes
Tuner Video
Supplied power for tuner is OK? pin1, 3 : 5V pin16 : 33V
No
Check SMPS (AL5.8V and 33V)
Yes
I2C signal pic 11, 12 of tuner is OK?
No
Check between pin 11, 12 of tuner and FIC1.
Yes
Video output signal of Tuner is OK? (Jack PCB)
No
Replace TM (Tuner) block.
Yes
Refer to AV3 Video line error


Tuner Audio Out Abnormal
Tuner line signal is OK?
No
Tuner line connect TV directly.
Yes
Supplied power
for TIC1 (5V, 8V)is OK?
(Jack PCB)
No
Check its power line or around elements
Yes
5.5MHz signal from pin 15
of Tuner is OK?
No
Check the SIF signal or Tuner
Tuner Audio
Yes
Does TY1 make
18.432MHz signal?
(Jack PCB)
No
Check TY1 or around elements
Yes
If Audio R/L signal (pin 30, 31 of TIC1)
is normal, refer to AV3 Audio Line in error


Remocon not working
KRMC1 (pin1) signal
is OK? (KEY PCB)
No
Check the power (pin2) line
of KRMC1 is 5V.
Yes
FIC1 (pin58) signal
is OK? (Jack PCB)
No
Check between FIC1(pin58) and KRMC1(pin1).
Yes
Change IC601 or arocwd elements

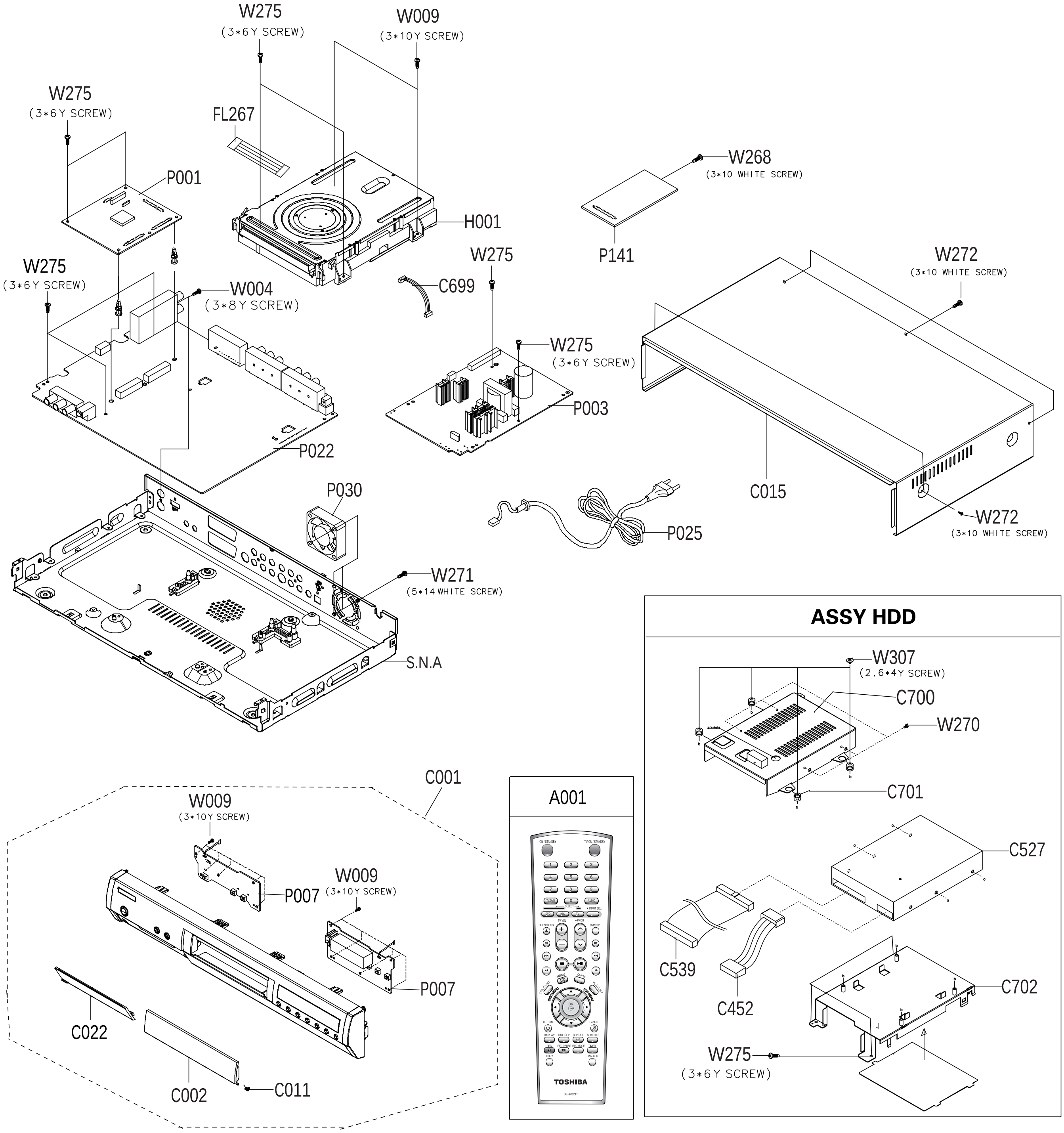
HDMI Video Output Error


Check the connector of HDMI cable with HDMI jack?
No
Correct the HDMI cable Connector.
Yes
The reset signal of HCON1-3 is high?
No
Check the HIC1-12, 14 peripheral circuit.
Yes
The VO_CLK of HCON1_11 is normal?
No
Check the DIC1-A16 peripheral circuit. (Main PCB)
Yes
The AO_CLK of HCON1-9 and AO_IEC968 of HCON1-7 is normal?
No
Check the DIC1-F24, A23 peripheral circuit. (Main PCB)
Yes
The SCL, SDA of HCON1-2,4 is normal?
No
Check the DIC1-AC19, AD21 and DIC8 peripheral circuit.
Yes
Check out the 3.3Vcc and 5Vcc of HCON1-8,10
No
Check the HIC1 peripheral circuit.
Yes
Replace the HIC1.

6. Exploded View and Parts List

6-1 Cabinet Assembly - 6-2

6-1 Cabinet Assembly


W275
(3*6Y SCREW)
W009
(3*10Y SCREW)
W275
(3*6Y SCREW)
FL267
P001
H001
W268
(3*10 WHITE SCREW)
P141
W275
(3*6Y SCREW)
W004
(3*8Y SCREW)
C699
W275
W275
(3*6Y SCREW)
W272
(3*10 WHITE SCREW)
P003
P022
P030
C015
P025
W272
(3*10 WHITE SCREW)
W271
(5*14 WHITE SCREW)
S.N.A
ASSY HDD
W307
(2.6*4Y SCREW)
C700
W270
C701
C001
A001
W009
(3*10Y SCREW)
W009
(3*10Y SCREW)
P007
P007
C527
C539
C452
C702
W275
(3*6Y SCREW)
C022
C002
C011
TOSHIBA

- **S.N.A.: Service Not Available**

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
A001	AK59-00028K	BY630568	REMOCON-ASSY;RD-XS64-S-TG,TSB,187.5*54,-	
C001	AK97-01332A	BY734215	ASSY-PANEL FRONT;HIPS 94HB,RD-XS64/TSB,0	
C002	AK64-01339A	BY734236	DOOR-TRAY;RD-XS64/TSB,ABS,T2.5,H31.6,W16	
C011	AK61-00137A	BY734044	SPRING ETC-DOOR;DVD-R4000,COIL,,,,,,PI0.	
C015	AK64-01263A	BY734232	CABINET-TOP;DVD-HR720,PCM,T0.625,W427.8,	
C022	AK64-01340A	BY734237	DOOR-FRONT;RD-XS64/TSB,ABS,T2.0,H25.9,W1	
C452	AK39-00050A	BY635025	LEAD CONNECTOR;LEAD CONNECTOR ASS,UL 100	
C527	AK59-00043A	BY635027	HDD;160G,SV1604E/OMD,512/SECTOR,4,	
C539	AK39-00051A	BY635026	WIRE HARNESS;CABLE ASS,2651#28 40COR,-,4	
C699	AK39-00044A	BY634895	LEAD CONNECTOR-ASSY;HS-030925-01,UL1007	
C700	AK61-00336A	BY734223	BRACKET-HDD/COVER;DVD-HR800,SECC US,T0.8	
C701	AK73-00028A	BY734249	RUBBER-HDD;DVD-HR800/XAA,BUTHYL 40Hs,10*	
C702	AK61-00463A	BY734224	BRACKET-HDD BOTTOM;DVD-HR720,SECC,T0.8,W	
FL267	3809-001673	BY635023	FFC CABLE-FLAT;30V,80C,145mm,40P,0.5mm,U	
H001	AK97-01211A	BY634963	ASSY-ASSY LOADER DRIVE;-,SV-R250,ASSY LO	
P001	AK92-00747A	BY630574	ASSY PCB-MAIN;RD-XS64,MAIN ASSY	
P003	AK92-00654A	BY630570	ASSY PCB-SMPS;DVD-HR720,DVD-HR720 SMPS	
P007	AK92-00733A	BY630572	ASSY PCB-KEY;RD-XS64,RIGHT	
-	AK92-00733B	BY630573	ASSY PCB-KEY;RD-XS64,LEFT	
P022	AK92-00652F	BY630578	ASSY PCB-JACK;RD-XS64,TF	RD-XS64SF
	AK92-00652E	BY630569	ASSY PCB-JACK;RD-XS64,TG	RD-XS64SG
⚠ P025	AC39-10019A	BY634124	CBF-POWER CORD;KKP-419C,H03VVH2-F,VDE/KE	
P030	3103-001154	BY734216	FAN-DC;DC 12.0V,110mA,2000rpm,0.388m^	
P141	AK92-00664B	BY630571	ASSY PCB-HDMI;DVD-HR725 PAL,HDMI	
W004	6003-000283	22797145	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	
W009	6003-000276	22797133	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(YEL),SWC	
W268	6003-000254	BY734068	SCREW-TAPTITE;BH,+,S,M3,L6,ZPC(WHT),SM20	
W270	6001-000742	BY734219	SCREW-MACHINE;PH,+,UNC6-32,L4.2,ZPC(WHT)	
W271	6009-001411	BY731644	SCREW-SPECIAL;TH,+,-,M5,L14,NI PLT,SWRCH	
W272	6003-001464	BY731645	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(WHT)	
W275	6003-001561	BY731750	SCREW-TAPTITE;BH,+,-,B,M3,L6,ZPC(YEL),SW	
W307	6001-001868	BY734220	SCREW-MACHINE;PWH,+,-,M2.6,L4,ZPC(YEL),S	
⚠ I/B	AK68-00875A	BY635031	MANUAL USERS;RD-XS64-S-TF,TSB,FRA,-,MOJO	RD-XS64SF
⚠	AK68-00874A	BY635028	MANUAL USERS;RD-XS64-S-TG,TSB,ENG,GER,ES	RD-XS64SG
	AC39-00018A	BY634851	CABLE-ETC-RF(SECAM);-,BOTH MALE,1200MM,R	RD-XS64SF
	AC39-00017A	BY634253	CABLE-ETC-RF(SECAM);-,MALE/FEMALE,1200MM,R	RD-XS64SG
	AC39-42001R	BY644791	CABLE-A/V;PVC,-,-,3P,-,-,-	

MEMO

7. Electrical Parts List

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
P001	**AK92-00747A**	**BY630574**	**ASSY PCB-MAIN;RD-XS64,MAIN ASSY**	
AC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC101	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC104	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
AC105	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC2	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC3	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC5	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC7	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC816	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
AC818	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
AC820	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
AC821	2203-001554	BY130450	C-CER,CHIP;1.8nF,10%,50V,X7R,TP,1608	
AC822	2402-001011	BY130567	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	
AC823	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
AC824	2203-001554	BY130450	C-CER,CHIP;1.8nF,10%,50V,X7R,TP,1608	
AC831	2402-001011	BY130567	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	
AC891	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC892	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC908	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC912	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC913	2402-001011	BY130567	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	
AC914	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC915	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
AC917	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
ADR001	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
AE1	2402-001042	BY130507	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	
AE2	2402-000202	BY130506	C-AL,SMD;100uF,20%,10V,WT,TP,6.6x6.6x5.	
AE3	2402-001042	BY130507	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	
AIC1	1002-001294	BY631221	IC-D/A CONVERTER;PCM1742KE,24BIT,TSSOP,1	
AIC2	1203-003180	BY631307	IC-POSI.FIXED REG.;MM1565,SOP,7P,5x4.4mm	
AIC3	1203-002178	BY631234	IC-POSI.FIXED REG.;1563,SOP,7P,173MIL,PL	
AIC81	1201-000163	BY631232	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	
AIC82	1201-000163	BY631232	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	
AIC9	1002-001387	BY631222	IC-A/D CONVERTER;PCM1802,24BIT,SSOP,20P,	
AR1	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR10	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR11	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR12	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR13	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR14	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR15	2007-000120	BY230350	R-CHIP;680ohm,5%,1/10W,TP,1608	
AR16	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR17	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR19	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
AR2	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
AR20	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR21	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR22	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR23	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR24	2007-000115	BY230348	R-CHIP;82ohm,5%,1/10W,TP,1608	
AR25	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR26	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR27	2007-000120	BY230350	R-CHIP;680ohm,5%,1/10W,TP,1608	
AR28	2007-000115	BY230348	R-CHIP;82ohm,5%,1/10W,TP,1608	
AR29	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR3	2007-000115	BY230348	R-CHIP;82ohm,5%,1/10W,TP,1608	
AR30	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR31	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR32	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR33	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR34	2007-000115	BY230348	R-CHIP;82ohm,5%,1/10W,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
AR4	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR5	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR51	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR52	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR6	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR7	2007-000115	BY230348	R-CHIP;82ohm,5%,1/10W,TP,1608	
AR8	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
AR801	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR802	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR803	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR804	2007-000082	BY230233	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	
AR805	2007-000122	BY230294	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	
AR806	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR807	2007-000122	BY230294	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	
AR808	2007-000082	BY230233	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	
AR809	2007-000080	BY230343	R-CHIP;2Kohm,5%,1/10W,TP,1608	
AR811	2007-000080	BY230343	R-CHIP;2Kohm,5%,1/10W,TP,1608	
AR812	2007-000080	BY230343	R-CHIP;2Kohm,5%,1/10W,TP,1608	
AR813	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR814	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AR881	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
AR882	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
AR894	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
AR895	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
AR9	2007-000115	BY230348	R-CHIP;82ohm,5%,1/10W,TP,1608	
ATAR1	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR2	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR3	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR4	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR5	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR6	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR7	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATAR8	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
ATCN1	3708-001935	BY634823	CONNECTOR-FPC/FFC/PIC;40P,0.5mm,SMD-S,Sn	
ATCN3	3711-005638	BY635022	HEADER-BOARD TO CABLE;BOX,40P,2R,2.54mm,	
C1	2203-000746	BY130517	C-CER,CHIP;0.03NF,5%,50V,C0G,TP,1608	
C10	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C11	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C12	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C123	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
C124	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
C125	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C126	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C127	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C128	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C129	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C13	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C130	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C140	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C141	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C142	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C143	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C144	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C145	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C146	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C147	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C150	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C166	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
C167	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C168	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C169	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C171	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C173	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
C174	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
C177	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C178	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
C179	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C183	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C184	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
C185	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C2	2203-000746	BY130517	C-CER,CHIP;0.03NF,5%,50V,C0G,TP,1608	
C214	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
C215	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C217	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C218	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C219	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
C220	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C222	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C223	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C224	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C227	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C228	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C230	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C231	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C232	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C3	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C5	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C7	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C8	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C9	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
CA1	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
CA2	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
CC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
CN1	3710-002075	BY634832	CONNECTOR-SOCKET;30P,2R,2MM,SMD,SnPb,BLK	
CN2	3710-002075	BY634832	CONNECTOR-SOCKET;30P,2R,2MM,SMD,SnPb,BLK	
CN3	3711-005595	BY634833	CONNECTOR-SOCKET;12P,2R,2MM,SMD-S,-,BLK	
CR1	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
CR2	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
CR3	2007-000083	BY230344	R-CHIP;3Kohm,5%,1/10W,TP,1608	
CR4	2007-001157	BY230363	R-CHIP;750ohm,5%,1/10W,TP,1608	
CR5	2007-001157	BY230363	R-CHIP;750ohm,5%,1/10W,TP,1608	
CR6	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
CR7	2007-001157	BY230363	R-CHIP;750ohm,5%,1/10W,TP,1608	
DC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC10	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC11	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC12	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC13	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC14	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC15	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC16	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC17	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC18	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
DC19	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
DC2	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC20	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
DC22	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC23	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
DC24	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC25	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
DC26	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC27	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
DC28	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC29	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC3	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC30	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC31	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC32	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC33	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC34	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC35	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC36	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC37	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC38	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC39	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
DC5	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC7	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC8	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DC9	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
DE1	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
DE3	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
DE4	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
DE6	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
DIC2	0801-002522	BY631215	IC-CMOS LOGIC;74VHC541,BUFFER/LINE DRIVE	
DIC3	1107-001273	BY631230	IC-FLASH MEMORY;29DL323,4Mx8/2Mx16,TSOP,	
DIC6	0802-001115	BY631219	IC-CMOS LOGIC;74ALVCH16373,D LATCH,TSSOP	
DIC7	0801-002587	BY631216	IC-CMOS LOGIC;74LVX541,8BIT BUFFER/DRIVE	
DIC8	1103-001134	BY631225	IC-EEPROM;24C040,512x8,SOP,8P,5.13x3.95m	
DNR1	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
DNR2	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
DNR3	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
DNR4	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
DR1	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
DR100	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR112	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR113	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
DR12	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR13	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR14	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR15	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR16	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR17	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR18	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR19	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR2	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR21	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR22	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR28	2007-008199	BY230404	R-CHIP;1.18Kohm,1%,1/10W,TP,1608	
DR3	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR31	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR37	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR4	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR45	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR46	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR47	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR56	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR57	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR58	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR59	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR6	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR60	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR61	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR64	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR65	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR66	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
DR67	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR68	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR69	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
DR7	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR71	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
DR74	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
DR8	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR84	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR85	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR86	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR87	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
DR89	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
DR9	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DR90	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
DRA01	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DRA02	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DRA03	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
DRA04	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
FB23	2007-000029	70795513	R-CHIP;0ohm,5%,1/8W,TP,2012	
GND	AK63-00283A	BY734230	GROUND-DOMINO;DVD-VR325,SUS304,T0.2,W8,L	
HDMI_C	3710-002075	BY634832	CONNECTOR-SOCKET;30P,2R,2MM,SMD,SnPb,BLK	
HDR1	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HDR2	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
IC1	1205-002510	BY631342	IC-CODEC;DMN-8652,BGA,388P,35x35mm,PLAS	
IRR1	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PC10	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PC13	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PC14	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
PC17	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
PC18	2203-001607	BY130451	C-CER,CHIP;0.22nF,5%,50V,NP0,-,1608	
PC19	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PC20	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PC3	2203-000384	BY130521	C-CER,CHIP;0.015NF,5%,50V,C0G,TP,1608	
PC4	2203-000384	BY130521	C-CER,CHIP;0.015NF,5%,50V,C0G,TP,1608	
PC5	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
PC6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PC7	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
PC8	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
PC9	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
PE1	2402-000007	BY130502	C-AL,SMD;22uF,20%,6.3V,GP,TP,4.3x4.3x5.	
PE3	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
PE4	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
PE5	2402-000170	BY130503	C-AL,SMD;1uF,20%,50V,GP,TP,4.3x4.3x5.4,	
PE6	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
PE7	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
PHC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
PIC1	1205-001988	BY631248	IC-DATA COMM./GEN.;TSB41AB1-PAP,QFP,64P,	
PL2	3301-000353	BY330075	BEAD-SMD;120ohm,2x1.25x0.9mm,-,TP,-,-,-	
PL3	3301-000353	BY330075	BEAD-SMD;120ohm,2x1.25x0.9mm,-,TP,-,-,-	
PL4	3301-000353	BY330075	BEAD-SMD;120ohm,2x1.25x0.9mm,-,TP,-,-,-	
PR1	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
PR10	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
PR12	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR13	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR14	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR15	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR16	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR17	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR18	2007-000965	BY230303	R-CHIP;5.1Kohm,5%,1/10W,TP,1608	
PR19	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
PR2	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
PR20	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
PR21	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
PR22	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
PR23	2007-001056	BY230273	R-CHIP;6.2Kohm,5%,1/10W,TP,1608	
PR24	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR25	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR26	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR27	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR28	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR4	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
PR5	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR6	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR7	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
PR9	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
PRA1	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
PRA2	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
PY1	2801-004021	BY633022	CRYSTAL-SMD;24.576MHz,20ppm,28-AAN,12pF,	
R1	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R213	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R214	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R215	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R216	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R217	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R218	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R219	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
R220	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R221	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R222	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R223	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R224	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R225	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R226	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R227	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R228	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R229	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R230	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R232	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R234	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R237	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R238	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R239	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R240	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R241	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R242	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R243	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R246	2007-001044	BY230362	R-CHIP;56ohm,5%,1/10W,TP,1608	
R247	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R248	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R411	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
R67	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R68	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R69	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
R70	2007-001014	BY230361	R-CHIP;51OHM,5%,1/10W,TP,1608	
RC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
RC2	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
RC3	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
RC4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
RC5	2203-001683	BY130486	C-CER,CHIP;0.068nF,5%,50V,NP0,TP,1608	
RE1	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
RE2	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
RE3	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
RE4	2402-001237	BY130509	C-AL,SMD;330uF,##20%,6.3V,-,REEL,6.3X7.	
RIC1	1203-003182	BY631242	IC-POSI.FIXED REG.;LP3965,TO-263,5P,10.1	
RIC2	1203-002612	BY631236	IC-POSI.ADJUST REG.;3966,TO-263,5P,10.16	
RL4	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
RP1	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP10	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP12	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP14	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP15	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP17	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP18	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP19	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP20	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP21	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
RP22	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
RP23	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
RP24	2011-000002	BY230365	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	
RP25	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP26	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP27	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP28	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP29	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP3	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP30	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP31	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP34	2011-001194	BY230370	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	
RP5	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RP7	2011-000686	BY230368	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	
RR3	2007-000965	BY230303	R-CHIP;5.1Kohm,5%,1/10W,TP,1608	
RR4	2007-000300	70795516	R-CHIP;10Kohm,5%,1/8W,TP,2012	
TC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC11	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC12	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
TC14	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC17	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC2	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC20	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC21	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC24	2203-002793	BY130032	C-CER,CHIP;1000nF,+80-20%,25V,Y5V,2012	
TC25	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC31	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC34	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC38	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC41	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC48	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC5	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC55	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC61	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC67	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC74	2203-000646	BY130514	C-CER,CHIP;0.024NF,5%,50V,C0G,TP,1608	
TC75	2203-000646	BY130514	C-CER,CHIP;0.024NF,5%,50V,C0G,TP,1608	
TC76	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC78	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC8	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC90	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC91	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC92	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TE2	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
TE3	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
TE4	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
TE5	2402-000204	BY130566	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	
TIC1	1204-002235	BY631247	IC-PAL/NTSC DECODER;TVP5146PFP,PQFP,80P,	
TIC2	1203-002577	BY631235	IC-POSI.FIXED REG.;MM1561J,SOP,7P,173MIL	
TNR50	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
TNR54	2011-000475	BY230366	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	
TNR60	2011-000515	BY230367	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	
TNR66	2011-000515	BY230367	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	
TR28	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
TR29	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
TR30	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR33	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
TR34	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
TR36	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR37	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR40	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
TR43	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
TR44	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
TR69	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR70	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR711	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR72	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
TR73	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
TR74	2007-000102	BY230292	R-CHIP;100Kohm,5%,1/10W,TP,1608	
TR75	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
TX1	2801-004183	BY633026	CRYSTAL-SMD;14.31818MHZ,30PPM,28-AAN,16P	
U23	1105-001530	BY631228	IC-DRAM;K4H561638,16Mx16Bit,TSOPII,66P	
U24	1105-001530	BY631228	IC-DRAM;K4H561638,16Mx16Bit,TSOPII,66P	
U25	1203-003038	BY631238	IC-POSI.ADJUST REG.;LP2995,SO,8P,4.9x3.9	
U34	0401-000008	BY430108	DIODE-SWITCHING;DAN217,80V,100MA,SOT-23,	
Y1	2801-004182	BY633025	CRYSTAL-SMD;13.5MHZ,10PPM,28-AAN,24PF,60	
P003	**AK92-00654A**	**BY630570**	**ASSY PCB-SMPS;DVD-HR720,DVD-HR720 SMPS**	
DINR1	2001-000734	70795040	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	
FANCON	3711-003942	BY634884	HEADER-BOARD TO CABLE;BOX,2P,1R,2mm,STRA	
FC1S01	3602-000103	BY634083	FUSE-CLIP;-,-,10mohm	
FC1S02	3602-000103	BY634083	FUSE-CLIP;-,-,10mohm	
FCON1	3708-001802	BY635008	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,STRAIGH	
⚠ PACT1	2301-001719	BY130538	C-FILM,LEAD;100nF,10%,275V,TP,17.5*6*12m	
⚠ PACT2	2301-001719	BY130538	C-FILM,LEAD;100nF,10%,275V,TP,17.5*6*12m	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
PADT1	0402-000550	BY430122	DIODE-BRIDGE;D2SBA60,600V,1.5A,-	
⚠ PAFT1	3601-000237	BY634950	FUSE-CARTRIDGE;250V,2A,SLOW-BLOW,CERAMIC	
⚠ PALT1	AC29-30050C	BY330008	FILTER LINE NOISE;-,25MH,0.35A,AC250V,BS	
⚠ PALT2	AC29-00002A	BY634272	FILTER LINE NOISE;-,30mH,-,-,BLF-2116	
PAVV1	1405-000186	70796217	VARISTOR;470V,2500A,17.5x7.5mm,TP	
PAVV2	1405-001026	BY634022	VARISTOR;470V,600A,9x7mm,TP	
PAWT1	3711-000203	BY634858	HEADER-BOARD TO CABLE;1WALL,2P/3P,1R,7.9	
PBBU1	3301-000297	BY330019	BEAD-AXIAL;25ohm,3.6x1.2x5.7mm,-,TP,-,-,	
⚠ PBCU1	2201-002044	BY130539	C-CERAMIC,DISC;0.1NF,10%,400V,Y5P,TP,8.5	
⚠ PBCU2	2201-002044	BY130539	C-CERAMIC,DISC;0.1NF,10%,400V,Y5P,TP,8.5	
⚠ PBCU3	2201-000987	BY130164	C-CERAMIC,DISC;2.2NF,20%,400V,Y5U,BK,12.	
⚠ PBIZ1	0604-001028	BY530004	PHOTO-COUPLER;TR,50-600%,250mW,DIP-4,ST	
⚠ PBIZ2	0604-001028	BY530004	PHOTO-COUPLER;TR,50-600%,250mW,DIP-4,ST	
PCN1	3710-002036	BY634997	SOCKET-BOARD TO BOARD;12P,1R,2.5mm,STRAI	
PCN2	3710-002036	BY634997	SOCKET-BOARD TO BOARD;12P,1R,2.5mm,STRAI	
PCNS5	3711-004379	BY634830	HEADER-BOARD TO CABLE;BOX,4P,1R,2MM,STRA	
PCNS6	3711-000240	BY635010	HEADER-BOARD TO CABLE;1WALL,4P,1R,3.96MM	
PDCZ1	2401-000598	BY130042	C-AL;1uF,20%,50V,GP,TP,4x7,5	
PDCZ2	2401-000598	BY130042	C-AL;1uF,20%,50V,GP,TP,4x7,5	
PDDZ1	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
PDDZ2	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
PDDZ5	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
PDRZ1	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PDRZ2	2001-000598	70795320	R-CARBON;3.3OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PDRZ3	2001-000449	70795020	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PDRZ4	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PDRZ5	2001-000598	70795320	R-CARBON;3.3OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PDRZ6	2001-000449	70795020	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFCD1	2307-000103	BY130549	C-FILM,LEAD-PCF;100nF,5%,50V,TP,-,5mm	
PFCF1	2307-000103	BY130549	C-FILM,LEAD-PCF;100nF,5%,50V,TP,-,5mm	
PFCZ1	2307-000104	BY130550	C-FILM,LEAD-PCF;10nF,5%,50V,TP,-,5mm	
PFCZ2	2401-003122	70795626	C-AL;4.7uF,20%,50V,LL,TP,5X7,5	
PFCZ3	2307-000104	BY130550	C-FILM,LEAD-PCF;10nF,5%,50V,TP,-,5mm	
PFCZ4	2401-003122	70795626	C-AL;4.7uF,20%,50V,LL,TP,5X7,5	
PFID1	AC14-12006D	70795271	IC;KA431Z,TO-92,TAPING	
PFIF1	AC14-12006D	70795271	IC;KA431Z,TO-92,TAPING	
PFRD1	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRD2	2001-000302	70795003	R-CARBON;10OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRD3	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRD4	2004-000459	70795638	R-METAL;2.2Kohm,1%,1/8W,AA,TP,1.8x3.2m	
PFRF1	2001-000780	70795039	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRF11	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRF2	2001-000221	BY230019	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFRF3	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRF5	2001-000591	70795031	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFRF6	2004-000459	70795638	R-METAL;2.2Kohm,1%,1/8W,AA,TP,1.8x3.2m	
PFRF9	2003-000148	BY230003	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	
PFRI1	2001-000780	70795039	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRI2	2001-000221	BY230019	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFRJ1	2001-000006	BY230095	R-CARBON;2.4KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFRZ1	2001-000527	70795018	R-CARBON;22OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRZ2	2001-000734	70795040	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFRZ3	2001-000527	70795018	R-CARBON;22OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PFRZ4	2001-000734	70795040	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	
PFZZ1	0403-001318	BY430107	DIODE-ZENER;MTZJ4.3B,4.17-4.43V,500MW,DO	
PFZZ2	0403-001318	BY430107	DIODE-ZENER;MTZJ4.3B,4.17-4.43V,500MW,DO	
PLRZ1	1404-001361	BY230396	THERMISTOR-NTC;3ohm,4A,-,35mW/C,-,9,TP	
PLRZ11	2003-002197	BY230219	R-METAL OXIDE;0.47ohm,5%,2W,AF,TP,3.9x10	
PLRZ2	2003-002197	BY230219	R-METAL OXIDE;0.47ohm,5%,2W,AF,TP,3.9x10	
PPCD1	2401-000677	BY130564	C-AL;2200uF,20%,10V,GP,TP,10x20mm,5	
PPCD2	2401-001353	BY130225	C-AL;470uF,20%,10V,GP,TP,8x11.5,5	
PPCD3	2401-002144	BY130049	C-AL;47uF,20%,16V,GP,TP,5x11,5	
PPCF1	2401-000677	BY130564	C-AL;2200uF,20%,10V,GP,TP,10x20mm,5	
PPCF2	2401-000677	BY130564	C-AL;2200uF,20%,10V,GP,TP,10x20mm,5	
PPCF3	2401-003480	BY130339	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	
PPCF4	2401-001353	BY130225	C-AL;470uF,20%,10V,GP,TP,8x11.5,5	
PPCF5	2401-003122	70795626	C-AL;4.7uF,20%,50V,LL,TP,5X7,5	
PPCF6	2401-002144	BY130049	C-AL;47uF,20%,16V,GP,TP,5x11,5	
PPCF8	2401-002144	BY130049	C-AL;47uF,20%,16V,GP,TP,5x11,5	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
PPCI2	2401-001126	BY130045	C-AL;330uF,20%,25V,WT,TP,10x12.5,5	
PPCI3	2401-000302	BY130224	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
PPCI4	2401-000302	BY130224	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
PPCI5	2401-000302	BY130224	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
PPCI6	2401-000302	BY130224	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
PPCI7	2401-000302	BY130224	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
PPCJ1	2401-001126	BY130045	C-AL;330uF,20%,25V,WT,TP,10x12.5,5	
PPCO1	2401-000392	BY130361	C-AL;10uF,20%,100V,WT,TP,6.3x11,2.5	
PPCO2	2401-000392	BY130361	C-AL;10uF,20%,100V,WT,TP,6.3x11,2.5	
PPDD1	0404-001225	BY430112	DIODE-SCHOTTKY;SRAF560,60V,5000mA,ITO-22	
PPDD2	0404-001225	BY430112	DIODE-SCHOTTKY;SRAF560,60V,5000mA,ITO-22	
PPDF1	0402-001587	BY430124	DIODE-RECTIFIER;SFAF504G,200V,5A,TO-220A	
PPDF2	0402-001587	BY430124	DIODE-RECTIFIER;SFAF504G,200V,5A,TO-220A	
PPDF3	0402-001587	BY430124	DIODE-RECTIFIER;SFAF504G,200V,5A,TO-220A	
PPDI2	0402-001194	BY430010	DIODE-RECTIFIER;SHG2D,200V,2A,-,TP	
PPDJ1	0402-001194	BY430010	DIODE-RECTIFIER;SHG2D,200V,2A,-,TP	
PPDO1	0402-000012	BY430047	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	
PPDZ6	0402-000165	BY430121	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	
PPIF2	1203-001589	BY631340	IC-POSI.FIXED REG.;278R05,TO-220F,4P,-,P	
PPIF3	1203-003293	BY631244	IC-POSI.FIXED REG.;G9205,TO-220F,4P,10.1	
PPIF4	1203-003293	BY631244	IC-POSI.FIXED REG.;G9205,TO-220F,4P,10.1	
PPIF5	1203-003293	BY631244	IC-POSI.FIXED REG.;G9205,TO-220F,4P,10.1	
PPII1	AC14-12006N	70796345	IC-VOLT REGU;KA78R12,SIP,STICK	
PPII2	1203-002183	BY631306	IC-SWITCH VOL. REG.;278R12,TO-220F-4L,4P	
PPII3	1203-002183	BY631306	IC-SWITCH VOL. REG.;278R12,TO-220F-4L,4P	
PPLD1	AH27-00039A	BY330081	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	
PPLF1	AH27-00039A	BY330081	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	
PPLF2	AH27-00039A	BY330081	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	
PPQD1	0505-001565	BY530076	FET-SILICON;GFP50N03,N,30V,50A,20MOHM,62	
PPRD1	2003-000148	BY230003	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	
PPRD2	2003-000148	BY230003	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	
PPRI1	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
PPRO1	2001-000062	70796173	R-CARBON;470OHM,5%,1/4W,AA,TP,2.4X6.4MM	
PPZO1	0403-000390	70795272	DIODE-ZENER;UZP33B,31.4-34.6V,1000MW,DO-	
PQIZ1	1203-002805	BY631237	IC-PWM CONTROLLER;ICE2BS01,PDIP,8P,9.52X	
PQIZ2	1203-002805	BY631237	IC-PWM CONTROLLER;ICE2BS01,PDIP,8P,9.52X	
PQQX1	0505-001729	BY530077	FET-SILICON;SPA04N60C3,N,600V,4.5A,0.85O	
PQQX2	0505-001729	BY530077	FET-SILICON;SPA04N60C3,N,600V,4.5A,0.85O	
⚠ PQTZ1	AC26-00014D	BY330098	TRANS SWITCHING;EE2722,HDD COMBO,-,FREE,	
⚠ PQTZ2	AC26-00014E	BY330099	TRANS SWITCHING;EER3126,HDD COMBO,-,FREE	
PRCU1	2401-003842	BY130561	C-AL;100UF,20%,450V,WT,BK,25.4X25,1	
PSCZ1	2305-001029	BY130226	C-FILM,LEAD-PEF;10nF,10%,630V,TP,12x9x12	
PSCZ2	2201-000129	BY130258	C-CERAMIC,DISC;0.1nF,10%,1000V,Y5P,-,7x4	
PSCZ3	2305-001029	BY130226	C-FILM,LEAD-PEF;10nF,10%,630V,TP,12x9x12	
PSCZ4	2201-000129	BY130258	C-CERAMIC,DISC;0.1nF,10%,1000V,Y5P,-,7x4	
PSDZ1	0402-000012	BY430047	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	
PSDZ11	0402-000012	BY430047	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	
PSRZ1	2003-000994	BY230027	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	
PSRZ2	2003-000994	BY230027	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	
PSRZ3	2003-000994	BY230027	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	
PSRZ4	2003-000994	BY230027	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	
PVCL1	2401-004141	BY130562	C-AL;33uF,20%,35V,GP,TP,6.3x7mm,5	
PVCL2	2401-004141	BY130562	C-AL;33uF,20%,35V,GP,TP,6.3x7mm,5	
PVDL1	0402-001195	BY430011	DIODE-RECTIFIER;F1T4,400V,1A,DO-204AC,TP	
PVDL2	0402-001195	BY430011	DIODE-RECTIFIER;F1T4,400V,1A,DO-204AC,TP	
PVRL1	2001-000546	BY230318	R-CARBON;270KOHM,5%,1/4W,AA,TP,2.4X6.4M	
PVRL2	2001-000546	BY230318	R-CARBON;270KOHM,5%,1/4W,AA,TP,2.4X6.4M	
PVRL3	2001-000546	BY230318	R-CARBON;270KOHM,5%,1/4W,AA,TP,2.4X6.4M	
PVRL4	2001-000666	BY230386	R-CARBON;33OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PVRL5	2001-000546	BY230318	R-CARBON;270KOHM,5%,1/4W,AA,TP,2.4X6.4M	
PVRL6	2001-000546	BY230318	R-CARBON;270KOHM,5%,1/4W,AA,TP,2.4X6.4M	
PVRL7	2001-000546	BY230318	R-CARBON;270KOHM,5%,1/4W,AA,TP,2.4X6.4M	
PVRL8	2001-001352	BY230402	R-CARBON;62OHM,5%,1/8W,AA,TP,1.8X3.2MM	
PVZL1	0403-000713	BY430110	DIODE-ZENER;MTZJ20B,18.63-17.7V,500MW,DO	
PVZL2	0403-000713	BY430110	DIODE-ZENER;MTZJ20B,18.63-17.7V,500MW,DO	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
P022	AK92-00652F	BY630578	ASSY PCB-JACK;RD-XS64,TF	RD-XS64SF
	AK92-00652E	BY630569	ASSY PCB-JACK;RD-XS64,TG	RD-XS64SG
AC20	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC202	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC203	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC204	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
-	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
-	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC406	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC407	2203-000125	BY130520	C-CER,CHIP;1.2nF,10%,50V,X7R,TP,1608,-	
AC408	2203-000125	BY130520	C-CER,CHIP;1.2nF,10%,50V,X7R,TP,1608,-	
AC409	2203-000315	BY130441	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	
AC410	2203-000315	BY130441	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	
AC413	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AC702	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC703	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
AC705	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
AC714	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
AC715	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AC716	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
ACC20	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
ACC21	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
AD1	0407-000114	BY430113	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	
AD2	0407-000114	BY430113	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	
AD3	0407-000114	BY430113	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	
AD51	0407-000114	BY430113	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	
AD54	0407-000114	BY430113	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	
AD55	0407-000114	BY430113	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	
AE100	2401-001502	BY130535	C-AL;47uF,20%,16V,GP,TP,6.3x5,2.5	
AE201	2401-001915	70795114	C-AL;1uF,20%,50V,GP,TP,3x5,5	
-	2401-001250	70796211	C-AL;4.7uF,20%,35V,GP,TP,4x5,5	
AE4	2401-001250	70796211	C-AL;4.7uF,20%,35V,GP,TP,4x5,5	
AE405	2404-000256	BY130511	C-TA,CHIP;47UF,20%,16V,GP,TP,7343	
AE41	2404-000284	BY130512	C-TA,CHIP;10uF,20%,16V,-,TP,3528	
AE42	2401-000922	BY130044	C-AL;22uF,20%,16V,GP,TP,5x5,5	
AE46	2401-000922	BY130044	C-AL;22uF,20%,16V,GP,TP,5x5,5	
AE47	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
AE51	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
AE52	2401-000303	70795779	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
AE701	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE702	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE705	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE712	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE714	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE715	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE720	2401-000303	70795779	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
AE721	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
AE722	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
-	AH14-10004R	BY631252	IC;M74HCU04,SOP,TAPE 14P	
AIC4	1201-000163	BY631232	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	
AIC5	1201-000163	BY631232	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	
AIC51	0801-001270	BY631325	IC-CMOS LOGIC;4052,MUX/DEMUX,SOP,16,150M	
AL1	2007-000029	70795513	R-CHIP;0ohm,5%,1/8W,TP,2012	
AL10	2701-000114	22291707	INDUCTOR-AXIAL;10UH,10%,2534	
AL11	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL12	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL13	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL14	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL15	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL16	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL2	3301-000314	BY330074	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	
AL201	2901-001125	BY330094	FILTER-EMI ON BOARD;50V,0.5A,-,220pF,7x2	
AL3	3301-000314	BY330074	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	
AL5	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL6	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL7	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AL8	2701-000181	BY330053	INDUCTOR-AXIAL;33uH,5%,2434	
AMC01	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
AME01	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
AME2	2401-001543	BY130543	C-AL;47uF,20%,25V,GP,TP,6.3x5mm,2.5	
AQ1	0501-000341	BY530073	TR-SMALL SIGNAL;KSC1623-L,NPN,200mW,SOT-	
AQ3	0501-000341	BY530073	TR-SMALL SIGNAL;KSC1623-L,NPN,200mW,SOT-	
AQ4	0504-000128	BY530074	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
AQ5	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
AQ51	0504-000128	BY530074	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
AQ52	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
AQ55	0501-000002	BY430105	TR-SMALL SIGNAL;KSA812,PNP,150MW,SOT-23,	
AQ6	0504-000128	BY530074	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
AQ7	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
-	2007-001010	BY230360	R-CHIP;51Kohm,5%,1/10W,TP,1608	
-	2007-001010	BY230360	R-CHIP;51Kohm,5%,1/10W,TP,1608	
-	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
-	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
-	2007-001010	BY230360	R-CHIP;51Kohm,5%,1/10W,TP,1608	
AR18	2007-001010	BY230360	R-CHIP;51Kohm,5%,1/10W,TP,1608	
AR201	2007-000076	BY230310	R-CHIP;330ohm,5%,1/10W,TP,1608	
AR202	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
AR203	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
-	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
AR303	2001-000221	BY230019	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
-	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
AR40	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
AR404	2007-001010	BY230360	R-CHIP;51Kohm,5%,1/10W,TP,1608	
AR408	2007-001010	BY230360	R-CHIP;51Kohm,5%,1/10W,TP,1608	
AR409	2007-000092	BY230287	R-CHIP;15Kohm,5%,1/10W,TP,1608	
AR410	2007-000092	BY230287	R-CHIP;15Kohm,5%,1/10W,TP,1608	
AR411	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR412	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
AR413	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
AR414	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
AR415	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
AR420	2007-000122	BY230294	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	
AR421	2007-001179	BY230305	R-CHIP;8.2Kohm,5%,1/10W,TP,1608	
AR460	2007-000122	BY230294	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	
AR461	2007-001179	BY230305	R-CHIP;8.2Kohm,5%,1/10W,TP,1608	
AR471	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
AR472	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
AR473	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
AR474	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
AR475	2007-000075	BY230277	R-CHIP;220ohm,5%,1/10W,TP,1608	
-	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
-	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
AR54	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
AR55	2007-000102	BY230292	R-CHIP;100Kohm,5%,1/10W,TP,1608	
AR56	2007-000077	BY230278	R-CHIP;470ohm,5%,1/10W,TP,1608	
AR702	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
AR713	2001-000221	BY230019	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
AR715	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
AR722	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
AR735	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
ASQ01	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
ASQ02	0504-000128	BY530074	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
ASQ03	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
ASQ04	0504-000128	BY530074	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
ASR01	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
ASR02	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
AVJ1	3722-002318	BY635006	JACK-PIN;3P(7P),SN/NI,RED/BLU/GRN,ANGLE	
AVJ2	3722-002111	BY634890	JACK-PIN;6P+1P,SN/NI,RED/WHT/YEL/BLK,AN	
AVJ5	3707-001070	BY634996	CONNECTOR-OPTICAL;PLUG,GP1FA550TZ,6dB,2.	
C018	AK60-00006B	BY734222	SPACER-SUPPORT;DVD-HD931,NYLON6.6,L37.4,	
C201	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C210	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C216	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
C226	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
CE75	2401-000118	70796210	C-AL;1000uF,20%,10V,GP,TP,10x12.5,5	
CE76	2401-000118	70796210	C-AL;1000uF,20%,10V,GP,TP,10x12.5,5	
CN7	3722-002118	BY634839	JACK-IEEE1394;4P,NI,BLK,ANGLE,IEEE1394	
CON4	3708-001802	BY635008	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,STRAIGH	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
CORD C	AH65-00001A	BY734221	CLAMPER CORE;DVD-909,DALA-2,-,-,BLK,XAA	
CVL0	3301-001419	BY330073	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	
CVL1	3301-001419	BY330073	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	
CVL2	3301-001419	BY330073	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	
D551	3811-000389	70693052	WIRE-NO SHEATH CU;SPCW,300V,52.4mm,1/0.5	
D701	0402-001494	BY430123	DIODE-RECTIFIER;SF24G,200V,2A,DO-15,TP	
E202	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
E203	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
E206	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
E212	2401-001502	BY130535	C-AL;47uF,20%,16V,GP,TP,6.3x5,2.5	
ESD01	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD02	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD03	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD04	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD05	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD06	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD07	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD08	0403-000718	BY430118	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	
ESD14	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
ESD15	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
FC10	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
FC11	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
FC12	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
FC21	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
FC22	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
FC3	2203-000626	BY130444	C-CER,CHIP;0.022nF,5%,50V,C0G,TP,1608	
FC4	2203-000626	BY130444	C-CER,CHIP;0.022nF,5%,50V,C0G,TP,1608	
FC6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
FC7	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
FC8	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
FC9	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
FD2	0402-000165	BY430121	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	
FD3	0402-000165	BY430121	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	
FD4	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
FD6	0402-000165	BY430121	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	
FD7	0402-000165	BY430121	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	
FD8	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
FE2	2404-000275	BY130553	C-TA,CHIP;100UF,10%,10V,GP,TP,7343	
FE4	2401-002165	BY130280	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
FE6	2401-001730	70795625	C-AL;10UF,20%,50V,GP,TP,5X11,5	
FE7	2401-001250	70796211	C-AL;4.7uF,20%,35V,GP,TP,4x5,5	
FE8	2401-001730	70795625	C-AL;10UF,20%,50V,GP,TP,5X11,5	
FED33	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
FED34	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
FIC1	AC09-00598A	BY631343	IC MICOM;N128-B96-3BA,DVD-HR720E-02,100	
FIC2	1103-001224	BY631301	IC-EEPROM;524L50X51,2Kx8,SOP,8P,5.13x4mm	
FIC5	AC14-12006C	70795269	IC;KA7533,DIP,-	
FL3	2701-000002	BY330009	INDUCTOR-AXIAL;100UH,10%,4298	
FR1	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR100	2007-000102	BY230292	R-CHIP;100Kohm,5%,1/10W,TP,1608	
FR12	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR13	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR14	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
FR15	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR17	2007-000431	BY230355	R-CHIP;16Kohm,5%,1/10W,TP,1608	
FR18	2007-000586	70795527	R-CHIP;22Kohm,5%,1/8W,TP,2012	
FR19	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR2	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
FR20	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR201	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
FR24	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
FR27	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR28	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR29	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR30	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR302	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR31	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR4	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR41	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
FR47	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
FR61	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
FR80	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
FRONT	3722-001943	BY634864	JACK-PIN;3P,8.3PI,NI,BLK,-	
FY1	2801-003139	BY633010	CRYSTAL-UNIT;8MHz,50ppm,28-AAA,22pF,80oh	
HOLDER	AK61-00462A	BY734109	SUPPORT-PCB;SV-R2500,NYLON 6.6,2mm,PI 5m	
IC201	0801-001094	BY631298	IC-CMOS LOGIC;74HC4051,MULTIPLEXER,SOP,1	
IC203	0801-001270	BY631325	IC-CMOS LOGIC;4052,MUX/DEMUX,SOP,16,150M	
L331	2701-000114	22291707	INDUCTOR-AXIAL;10UH,10%,2534	
L332	2701-000002	BY330009	INDUCTOR-AXIAL;100UH,10%,4298	
OC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
OC10	2203-000975	BY130484	C-CER,CHIP;47nF,10%,25V,X7R,TP,1608,-	
OC2	2203-000426	BY130474	C-CER,CHIP;0.018NF,5%,50V,C0G,TP,1608	
OC3	2203-001071	BY130465	C-CER,CHIP;0.056nF,5%,50V,C0G,1608	
OC4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
OC5	2203-000440	BY130462	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	
OC6	2203-000681	BY130445	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	
OC7	2203-000681	BY130445	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	
OC8	2203-000426	BY130474	C-CER,CHIP;0.018NF,5%,50V,C0G,TP,1608	
OC9	2203-000426	BY130474	C-CER,CHIP;0.018NF,5%,50V,C0G,TP,1608	
OD2	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
OE1	2401-001507	70795621	C-AL;47uF,20%,16V,GP,TP,6.3x5,5	
OE2	2401-001915	70795114	C-AL;1uF,20%,50V,GP,TP,3x5,5	
OE3	2401-001915	70795114	C-AL;1uF,20%,50V,GP,TP,3x5,5	
OE4	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
OE5	2401-001502	BY130535	C-AL;47uF,20%,16V,GP,TP,6.3x5,2.5	
OE6	2401-001249	BY130496	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	
OL1	2701-000188	70796075	INDUCTOR-AXIAL;4.7uH,5%,2434	
OL2	2701-000188	70796075	INDUCTOR-AXIAL;4.7uH,5%,2434	
OL3	2701-000160	70795162	INDUCTOR-AXIAL;22uH,5%,2434	
OL4	2701-000165	BY330052	INDUCTOR-AXIAL;27uH,5%,2434	
OQ1	0501-000279	BY530079	TR-SMALL SIGNAL;KSA1182-Y,PNP,150mW,SOT-	
OQ2	0501-000279	BY530079	TR-SMALL SIGNAL;KSA1182-Y,PNP,150mW,SOT-	
OQ4	0501-000341	BY530073	TR-SMALL SIGNAL;KSC1623-L,NPN,200mW,SOT-	
OR1	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
OR10	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
OR11	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
OR15	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
OR16	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
OR17	2007-000123	BY230306	R-CHIP;1.5Kohm,5%,1/10W,TP,1608	
OR18	2007-000097	BY230290	R-CHIP;47Kohm,5%,1/10W,TP,1608	
OR19	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
OR2	2007-000118	BY230293	R-CHIP;390ohm,5%,1/10W,TP,1608	
OR3	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
OR30	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
OR31	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
OR32	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
OR4	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
OR5	2007-000086	BY230283	R-CHIP;5.6Kohm,5%,1/10W,TP,1608	
OR6	2007-000081	BY230281	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	
OR7	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	
OR8	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
OR9	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
OY1	2801-003311	BY634876	CRYSTAL-UNIT;17.734475MHz,50ppm,28-AAA,1	
CN3	3711-005612	BY634828	CONNECTOR-HEADER;BOX,30P,2R,2mm,STRAIGHT	
CN4	3711-005612	BY634828	CONNECTOR-HEADER;BOX,30P,2R,2mm,STRAIGHT	
CN5	AC37-00027A	BY634826	CONNECTOR-HEADER;20045WS,X-11,T8.5,W17.4	
-	3711-001246	BY634998	HEADER-BOARD TO BOARD;NOWALL,12P,1R,2.5m	
-	3711-001246	BY634998	HEADER-BOARD TO BOARD;NOWALL,12P,1R,2.5m	
POR01	2007-000080	BY230343	R-CHIP;2Kohm,5%,1/10W,TP,1608	
POR02	2007-000082	BY230233	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	
PQ1	0501-000362	BY530008	TR-SMALL SIGNAL;KSC2328A-Y,NPN,1000MW,TO	
PR04	2001-000405	70795607	R-CARBON;180OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SCC10	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC15	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
SCC16	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
SCC29	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
SCC3	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC30	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
SCC31	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
SCC32	2203-000491	BY130443	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	
SCC34	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
SCC4	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC40	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
SCC41	2203-005105	BY130488	C-CER,CHIP;0.68nF,5%,50V,C0G,1608	
SCC42	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
SCC43	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
SCC44	2203-005105	BY130488	C-CER,CHIP;0.68nF,5%,50V,C0G,1608	
SCC45	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
SCC49	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
SCC5	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC51	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
SCC6	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC7	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC8	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCC9	2203-000236	BY130439	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	
SCD2	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
SCE49	2401-002165	BY130280	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
SCE50	2401-000922	BY130044	C-AL;22uF,20%,16V,GP,TP,5x5,5	
SCE51	2401-000303	70795779	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	
SCE52	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE53	2401-000922	BY130044	C-AL;22uF,20%,16V,GP,TP,5x5,5	
SCE54	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE55	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
SCE56	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE57	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE58	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE59	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE60	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE70	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE71	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE91	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCE92	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SCJ1	3722-002321	BY634999	JACK-SCART;42P,-,SN+PB,BLK,-	
SCL11	2703-001973	BY330093	INDUCTOR-SMD;2.7uH,10%,1608	
SCL12	2703-001973	BY330093	INDUCTOR-SMD;2.7uH,10%,1608	
SCL13	2703-001973	BY330093	INDUCTOR-SMD;2.7uH,10%,1608	
SCL14	2703-001973	BY330093	INDUCTOR-SMD;2.7uH,10%,1608	
SCL5	AC27-92001M	70795644	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
SCL99	AC27-92001M	70795644	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
SCR1	2007-000116	BY230349	R-CHIP;120ohm,5%,1/10W,TP,1608	
SCR10	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
SCR11	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
SCR15	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR18	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR19	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR2	2007-000119	BY230332	R-CHIP;560ohm,5%,1/10W,TP,1608	
SCR20	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR21	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR22	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR23	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR24	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR25	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR26	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR27	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR28	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR3	2007-000119	BY230332	R-CHIP;560ohm,5%,1/10W,TP,1608	
SCR32	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR33	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR34	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
SCR35	2001-000969	70795054	R-CARBON;75OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SCR36	2001-000969	70795054	R-CARBON;75OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SCR37	2001-000969	70795054	R-CARBON;75OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SCR38	2007-000102	BY230292	R-CHIP;100Kohm,5%,1/10W,TP,1608	
SCR39	2007-000102	BY230292	R-CHIP;100Kohm,5%,1/10W,TP,1608	
SCR4	2007-000119	BY230332	R-CHIP;560ohm,5%,1/10W,TP,1608	
SCR5	2007-000119	BY230332	R-CHIP;560ohm,5%,1/10W,TP,1608	
SCR55	2007-000090	BY230285	R-CHIP;10Kohm,5%,1/10W,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
SCR56	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
SCR6	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SCR7	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
SCR8	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR9	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SCR996	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
SCR997	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
SCZ1	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ10	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ11	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ2	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ3	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ4	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ5	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ6	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ7	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ8	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SCZ9	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SD001	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
SE219	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SE221	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SE223	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
SIC1	1204-002094	BY631310	IC-AUDIO PROCESSOR;MM1647XJ,SSOP,34P,17.	
SJR1	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SJR4	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SJR5	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SJR6	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
SMQ1	0504-000128	BY530074	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	
SMQ2	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
SMQ3	0504-000152	BY530078	TR-DIGITAL;KSR2101,PNP,200mW,4.7K/4.7K,S	
SMR1	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
SVZ10	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SVZ7	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SVZ8	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
SVZ9	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
TC10	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC11	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC12	2203-001656	BY130453	C-CER,CHIP;0.47nF,5%,50V,NP0,TP,1608	
TC13	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
-	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC18	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
TC19	2203-000257	BY130440	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	
-	2203-000160	BY130524	C-CER,CHIP;0.0015NF,0.25PF,50V,C0G,TP,16	
-	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC27	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC28	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC3	2203-000160	BY130524	C-CER,CHIP;0.0015NF,0.25PF,50V,C0G,TP,16	
TC33	2203-000626	BY130444	C-CER,CHIP;0.022nF,5%,50V,C0G,TP,1608	
-	2203-001656	BY130453	C-CER,CHIP;0.47nF,5%,50V,NP0,TP,1608	
-	2203-000140	BY130459	C-CER,CHIP;1.5nF,10%,50V,X7R,1608	
TC6	2203-000140	BY130459	C-CER,CHIP;1.5nF,10%,50V,X7R,1608	
TC7	2203-001656	BY130453	C-CER,CHIP;0.47nF,5%,50V,NP0,TP,1608	
TC70	2203-001656	BY130453	C-CER,CHIP;0.47nF,5%,50V,NP0,TP,1608	
TC71	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC72	2203-000998	BY130446	C-CER,CHIP;0.047NF,5%,50V,C0G,TP,1608	
-	2203-001607	BY130451	C-CER,CHIP;0.22nF,5%,50V,NP0,-,1608	
TC81	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
TC9	2202-002037	BY130027	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	
TD1	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
TD2	0402-000127	70796385	DIODE-RECTIFIER;1N4002,100V,1A,DO-41,TP	
TE1	2401-002300	BY130559	C-AL;47uF,20%,50V,GP,TP,6.3x11,5	
TE10	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
TE11	2401-001249	BY130496	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	
TE12	2401-001077	BY130431	C-AL;330nF,20%,50V,GP,TP,4x7mm,5mm	
TE13	2401-001249	BY130496	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	
TE14	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
TE15	2401-003221	BY130499	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	
TE16	2401-000909	BY130494	C-AL;22uF,20%,16V,GP,TP,5x5,2.5	
TE19	2401-002186	BY130536	C-AL;3.3uF,20%,50V,GP,BK,4x5,2.5	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
-	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
TE20	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
TE25	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
-	2401-003604	BY130558	C-AL;10uF,20%,25V,WT,TP,5x5mm,2.5	
TE31	2401-000909	BY130494	C-AL;22uF,20%,16V,GP,TP,5x5,2.5	
TE32	2401-003221	BY130499	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	
TE33	2401-001502	BY130535	C-AL;47uF,20%,16V,GP,TP,6.3x5,2.5	
TE35	2401-002165	BY130280	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
-	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
TE40	2401-000249	BY130560	C-AL;100uF,20%,10V,GP,TP,6.3x5,5	
TE8	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
TFC7	2202-000279	70693047	C-CERAMIC,MLC-AXIAL;47pF,5%,50V,SL,TP,3.	
TFR10	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
TFR8	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
TFR9	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
-	1204-001765	BY631149	IC-AUDIO PROCESSOR;MSP3417D(PQFP),PQFP,4	
TIC2	1201-001063	BY631302	IC-OP AMP;2267,SOP,8P,300MIL,DUAL,6.7dB,	
TIC4	1204-001794	BY631157	IC-AUDIO PROCESSOR;LC74775NM-9808,MPF,30	
TL1	2701-000188	70796075	INDUCTOR-AXIAL;4.7uH,5%,2434	
TL2	2701-000188	70796075	INDUCTOR-AXIAL;4.7uH,5%,2434	
TL3	2701-000188	70796075	INDUCTOR-AXIAL;4.7uH,5%,2434	
TL4	2701-000002	BY330009	INDUCTOR-AXIAL;100UH,10%,4298	
TL6	2701-000002	BY330009	INDUCTOR-AXIAL;100UH,10%,4298	
TM1	AK40-00026A	BY630509	TM BLOCK;TCPL0601PD25A,PAL B/G,SECAM L/	RD-XS64SF
TM1	AK40-00025A	BY630508	TM BLOCK;TCSK0601PD25A,PAL B/G,I,D/K,UH	RD-XS64SG
TMR001	2001-000515	70795019	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TMR002	2001-000515	70795019	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TMR01	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
TR1	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
TR13	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
TR17	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR18	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR2	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
TR22	2001-000857	70795358	R-CARBON;560OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR23	2001-000857	70795358	R-CARBON;560OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR3	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
TR4	2001-000995	70795057	R-CARBON;820OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR5	2001-000995	70795057	R-CARBON;820OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR61	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR62	2001-000281	70795004	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
TR83	2007-001134	BY230381	R-CHIP;68ohm,5%,1/10W,TP,1608	
TR84	2007-000113	BY230328	R-CHIP;33ohm,5%,1/10W,TP,1608	
TY1	2801-004096	BY631285	CRYSTAL-UNIT;18.432MHZ,20PPM,28-AAA,16PF	
VBE04	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
VBE05	2401-000408	BY130395	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	
VBQ1	0501-000341	BY530073	TR-SMALL SIGNAL;KSC1623-L,NPN,200mW,SOT-	
VBR01	2007-000100	70795719	R-CHIP;68Kohm,5%,1/10W,TP,1608	
VBR02	2007-000102	BY230292	R-CHIP;100Kohm,5%,1/10W,TP,1608	
VBR03	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
VC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VC10	2203-000357	BY130442	C-CER,CHIP;0.15NF,5%,50V,C0G,TP,1608	
VC11	2203-001607	BY130451	C-CER,CHIP;0.22nF,5%,50V,NP0,-,1608	
VC12	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VC13	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
VC14	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
VC15	2203-001607	BY130451	C-CER,CHIP;0.22nF,5%,50V,NP0,-,1608	
VC16	2203-001607	BY130451	C-CER,CHIP;0.22nF,5%,50V,NP0,-,1608	
VC26	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
VC27	2203-005105	BY130488	C-CER,CHIP;0.68nF,5%,50V,C0G,1608	
VC28	2203-000783	BY130435	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	
VC3	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VC5	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VC6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VC7	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VDR1	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
VDR2	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
VDR3	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
VDR4	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
VDR5	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
VDR6	2007-000040	BY230339	R-CHIP;150ohm,1%,1/10W,TP,1608	
VE1	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
VE10	2401-000426	BY130103	C-AL;10uF,20%,16V,GP,TP,3.5x5,5	
VE11	2401-003107	BY130282	C-AL;47uF,20%,16V,GP,TP,5x7,5	
VE12	2401-002165	BY130280	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
VE13	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
VE14	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
VE3	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
VE5	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
VE7	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
VE9	2401-001479	BY130015	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	
VGC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
VGQ1	0501-000341	BY530073	TR-SMALL SIGNAL;KSC1623-L,NPN,200mW,SOT-	
VGQ2	0504-000156	BY530075	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	
VGR1	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
VIC1	1201-002085	BY631303	IC-VIDEO AMP;MM1623XFBE,SOP-28D,28P,17.7	
VIC2	1001-001293	BY631299	IC-VIDEO SWITCH;MM1507XNRE,-,SOT-26A,6P,	
VIC3	1204-001927	BY631309	IC-AUDIO PROCESSOR;MM1501,SOT,6P,-,PLAST	
VIC4	1204-001748	BY631283	IC-SELECTOR;MM1503XN,SOP,6P,63MIL,PLASTI	
VL5	2703-001973	BY330093	INDUCTOR-SMD;2.7uH,10%,1608	
VL6	2703-001973	BY330093	INDUCTOR-SMD;2.7uH,10%,1608	
VR10	2007-000119	BY230332	R-CHIP;560ohm,5%,1/10W,TP,1608	
VR11	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR12	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR13	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR14	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
VR15	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
VR16	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
VR23	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR31	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR34	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR35	2007-001167	BY230304	R-CHIP;75ohm,5%,1/10W,TP,1608	
VR9	2007-000070	BY230274	R-CHIP;0ohm,5%,1/10W,TP,1608	
VZ10	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
VZ5	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
VZ6	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
VZ7	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
VZ8	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
VZ9	0403-001083	BY430111	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	
W68	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
W71	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
ZD1	0403-000720	BY430013	DIODE-ZENER;MTZJ9.1B,8.57-9.01V,500MW,DO	
ZD2	0403-000390	70795272	DIODE-ZENER;UZP33B,31.4-34.6V,1000MW,DO-	
P141	**AK92-00664B**	**BY630571**	**ASSY PCB-HDMI;DVD-HR725 PAL,HDMI**	
HC1	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC10	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC11	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
HC12	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC2	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC3	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC4	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC5	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC6	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC7	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC8	2203-005148	BY130480	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	
HC9	2203-005065	BY130479	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	
HDCN1	3701-001313	BY731766	CONNECTOR-HDMI;19P,2R,PLUG,ANGLE,AU30U	
HDJ3	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
HDJ4	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
HE1	2402-000179	BY130505	C-AL,SMD;47uF,20%,16V,GP,TP,6.6x6.6x5.7	
HE2	2402-000135	BY130565	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	
HE3	2402-000135	BY130565	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	
HE4	2402-000176	BY130504	C-AL,SMD;10uF,20%,16V,GP,TP,4.3x4.3x5.4	
HE5	2402-000176	BY130504	C-AL,SMD;10uF,20%,16V,GP,TP,4.3x4.3x5.4	
HIC1	1205-002456	BY631341	IC-TRANSMITTER;SII9190CT64,TQFP,64P,10x1	
HIC3	0505-001679	BY530087	FET-SILICON;FDC6301N,N,25V,0.22A,5OHM,0.	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
HL1	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
HL11	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL12	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL13	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL14	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL15	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL16	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL17	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL18	2007-000071	BY230341	R-CHIP;22ohm,5%,1/10W,TP,1608	
HL2	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
HL20	3301-000353	BY330075	BEAD-SMD;120ohm,2x1.25x0.9mm,-,TP,-,-,-	
HL21	3301-000353	BY330075	BEAD-SMD;120ohm,2x1.25x0.9mm,-,TP,-,-,-	
HL3	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
HL4	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
HL5	2007-000033	70693337	R-CHIP;0ohm,5%,1/4W,TP,3216	
HR1	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
HR10	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
HR11	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
HR12	2007-000074	BY230276	R-CHIP;100ohm,5%,1/10W,TP,1608	
HR4	2007-001093	BY230403	R-CHIP;620ohm,5%,1/10W,TP,1608	
HR5	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
HR6	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
HR7	2007-000078	BY230279	R-CHIP;1Kohm,5%,1/10W,TP,1608	
HR8	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
HR9	2007-000084	BY230282	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	
-	3711-005612	BY634828	CONNECTOR-HEADER;BOX,30P,2R,2mm,STRAIGHT	
Q1	0504-000129	70795815	TR-DIGITAL;KSR1104,NPN,200mW,47K/47K,SOT	
T1	0401-000008	BY430108	DIODE-SWITCHING;DAN217,80V,100MA,SOT-23,	
T2	0401-000008	BY430108	DIODE-SWITCHING;DAN217,80V,100MA,SOT-23,	
P007	AK92-00733A	BY630572	ASSY PCB-KEY;RD-XS64,RIGHT	
D702	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
D703	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
D704	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
D705	0401-000101	70795150	DIODE-SWITCHING;1N4148,75V,150MA,DO-35,T	
DT701	AK07-00035A	BY635024	LED DISPLAY-OVAL TYPE;BCD-9036A,DVD-HR72	
FL286	3809-001667	BY635013	FFC CABLE-FLAT;30V,80C,70mm,10P,1.25mm,U	
-	2401-003221	BY130499	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	
-	2202-002037	BY130027	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	
-	2202-000173	BY130262	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,1	
HC13	2202-000797	70795075	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	
HC14	2401-001168	BY130495	C-AL;33uF,20%,16V,GP,TP,6.3x5,2.5	
HC15	2202-000797	70795075	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	
HC16	2401-003221	BY130499	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	
HC17	2202-002037	BY130027	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	
HR20	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR21	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR22	2001-000429	70795005	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR23	2001-000837	70795045	R-CARBON;51KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR25	2001-000780	70795039	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR26	2001-000273	70795007	R-CARBON;100KOHM,5%,1/8W,AA,TP,1.8X3.2M	
IC701	1003-001561	BY631280	IC-LED DRIVER;PT6961,SOP,32P,300MIL,-,40	
KCON1	3708-001803	BY635009	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,ANGLE,T	
KRMC1	0609-001189	BY630433	MODULE REMOCON;HORIZONTAL,16.4MM,TR	
L701	2701-000002	BY330009	INDUCTOR-AXIAL;100UH,10%,4298	
L702	2701-000002	BY330009	INDUCTOR-AXIAL;100UH,10%,4298	
SW701A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
SW702A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
SW703A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
SW704A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
SW705A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
SW706A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
SW709A	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
-	AK92-00733B	BY630573	ASSY PCB-KEY;RD-XS64,LEFT	

Loc. No	Reference No.	TSB Parts No.	Description ; Specification	Remark
-	3809-001667	BY635013	FFC CABLE-FLAT;30V,80C,70mm,10P,1.25mm,U	
-	2202-002037	BY130027	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	
-	2401-003221	BY130499	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	
HD1	0601-001928	BY430135	LED;ROUND,BLUE,3mm,465nm,3.6x3.8mm	
HD2	0601-000402	BY430134	LED;ROUND,YEL,3MM,585NM,-	
HD3	0601-000402	BY430134	LED;ROUND,YEL,3MM,585NM,-	
HQ1	0504-000118	70693238	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	
HQ2	0504-000118	70693238	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	
HQ3	0504-000118	70693238	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	
-	2001-000007	70795028	R-CARBON;3KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR2	2001-000515	70795019	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR3	2001-000515	70795019	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
-	2001-000290	70795006	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
HR6	2001-000734	70795040	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	
HSW1	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
HSW2	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
HSW3	3404-001182	BY632011	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	
KCON2	3708-001803	BY635009	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,ANGLE,T	

MEMO

8. Block Diagram

8-1 All Block Diagram -- 8-2

8-2 IC1 (DMN8652) Block Diagram --------------------------------- 8-3

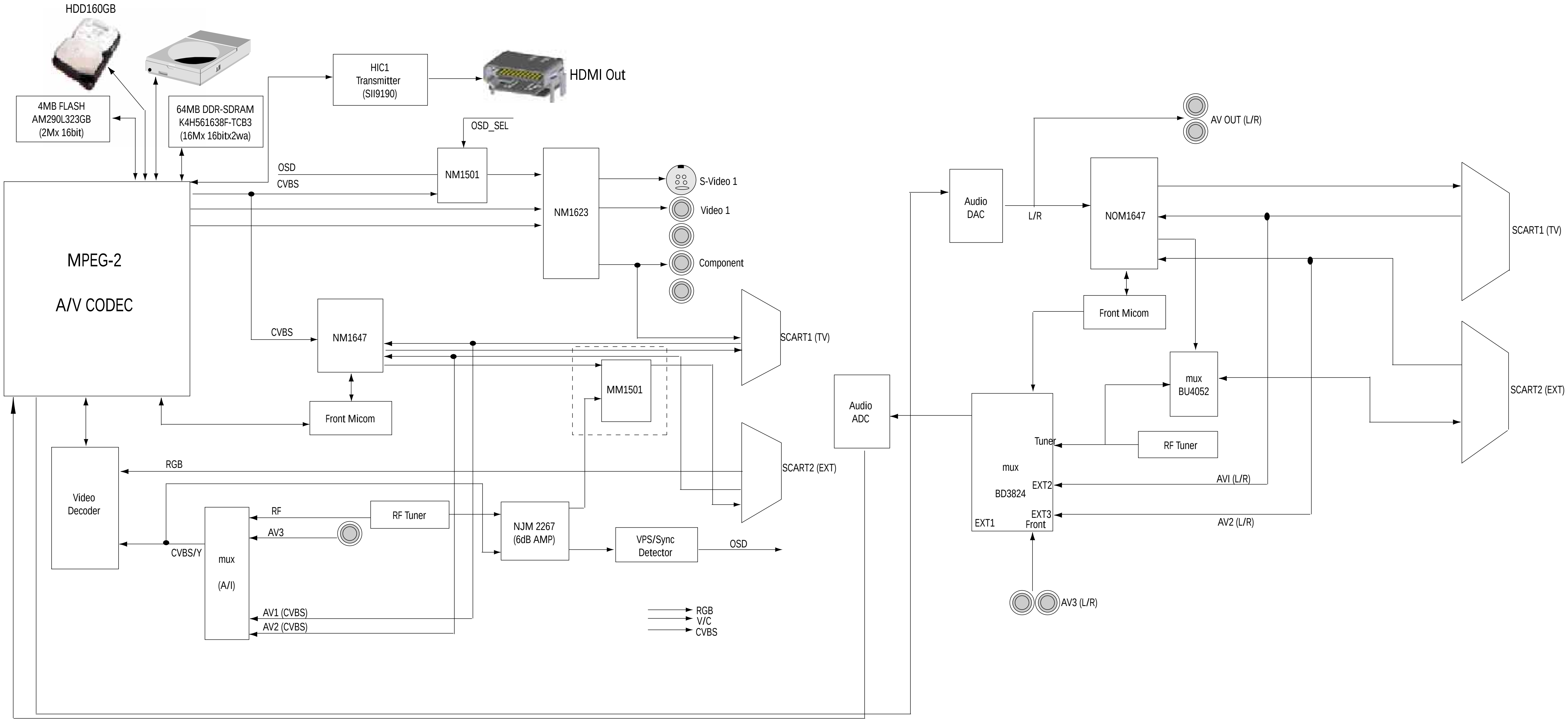
8-3 AIC1 (PCM1742) Block Diagram --------------------------------- 8-4

8-4 AIC9 (PCM1802) Block Diagram --------------------------------- 8-5

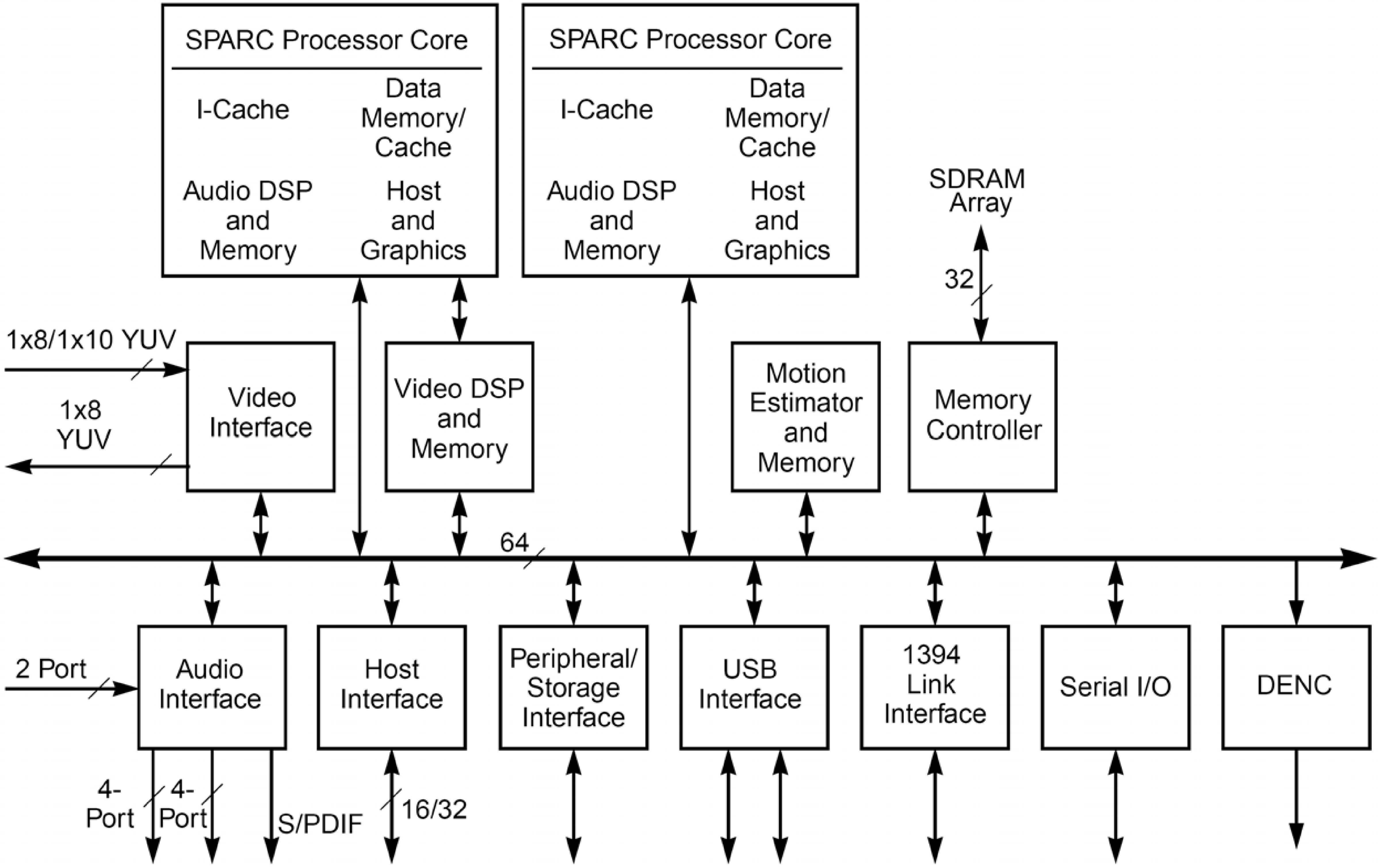
8-5 PIC1 (TSB4AB1) Block Diagram --------------------------------- 8-6

8-6 TIC1 (TVP5146) Block Diagram --------------------------------- 8-7

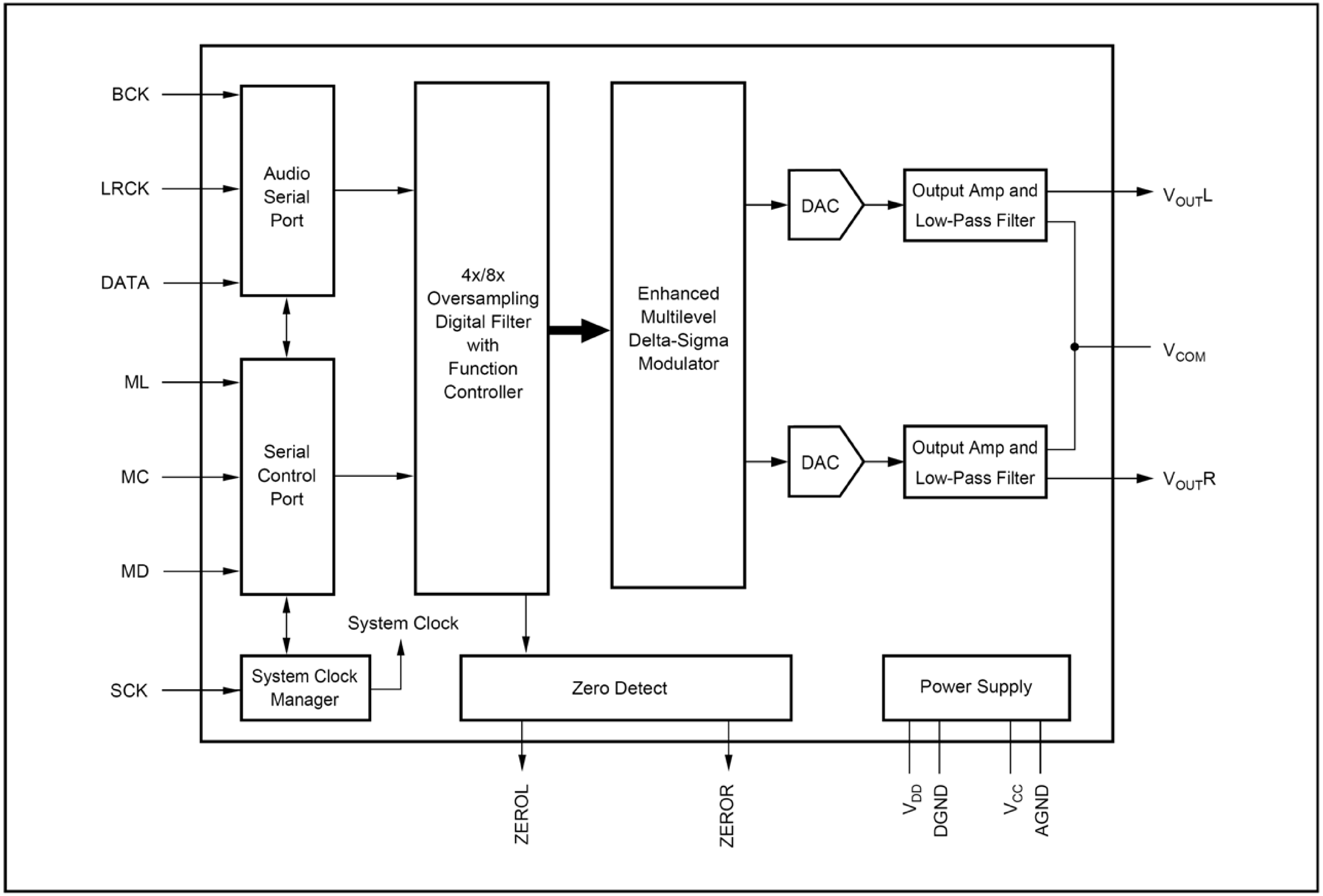
8-1 All Block Diagram


HDD160GB
4MB FLASH
AM290L323GB
(2Mx 16bit)
64MB DDR-SDRAM
K4H561638F-TCB3
(16Mx 16bitx2wa)
HIC1
Transmitter
(SII9190)
HDMI Out
OSD_SEL
OSD
CVBS
NM1501
NM1623
S-Video 1
Video 1
Component
MPEG-2
A/V CODEC
CVBS
NM1647
SCART1 (TV)
MM1501
Front Micom
SCART2 (EXT)
RGB
Video
Decoder
RF
RF Tuner
AV3
CVBS/Y
mux
(A/I)
NJM 2267
(6dB AMP)
VPS/Sync
Detector
OSD
AV1 (CVBS)
AV2 (CVBS)
RGB
V/C
CVBS
AV OUT (L/R)
Audio
DAC
L/R
NOM1647
SCART1 (TV)
Front Micom
mux
BU4052
SCART2 (EXT)
Audio
ADC
Tuner
RF Tuner
mux
BD3824
EXT2
AVI (L/R)
EXT3
EXT1
Front
AV2 (L/R)
AV3 (L/R)

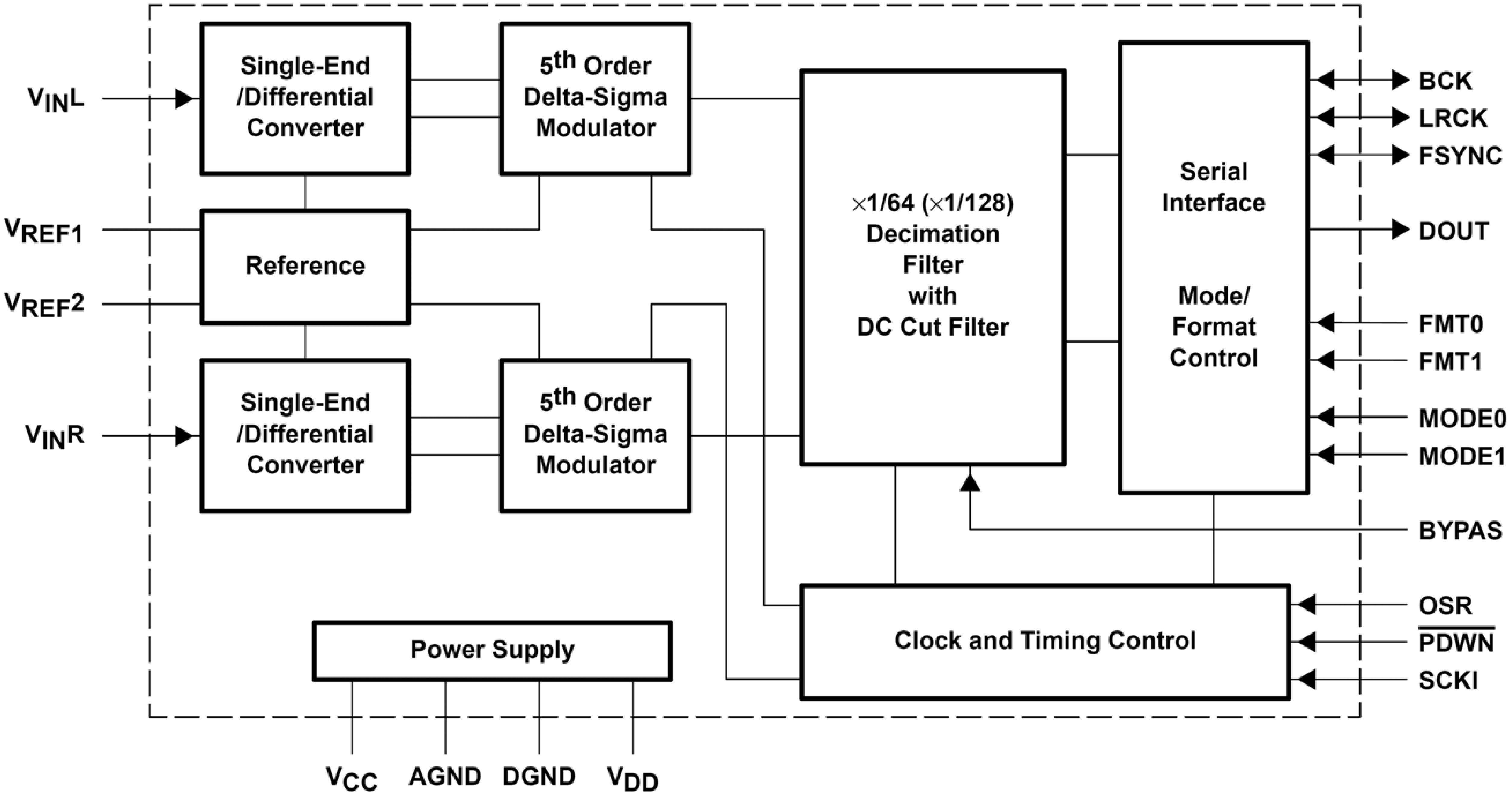
8-2 IC1 (DMN8652) Block Diagram


SPARC Processor Core
I-Cache
Data Memory/ Cache
Audio DSP and Memory
Host and Graphics
SPARC Processor Core
I-Cache
Data Memory/ Cache
Audio DSP and Memory
Host and Graphics
SDRAM Array
32
1x8/1x10 YUV
1x8 YUV
Video Interface
Video DSP and Memory
Motion Estimator and Memory
Memory Controller
64
2 Port
Audio Interface
Host Interface
Peripheral/ Storage Interface
USB Interface
1394 Link Interface
Serial I/O
DENC
4- Port
4- Port
S/PDIF
16/32

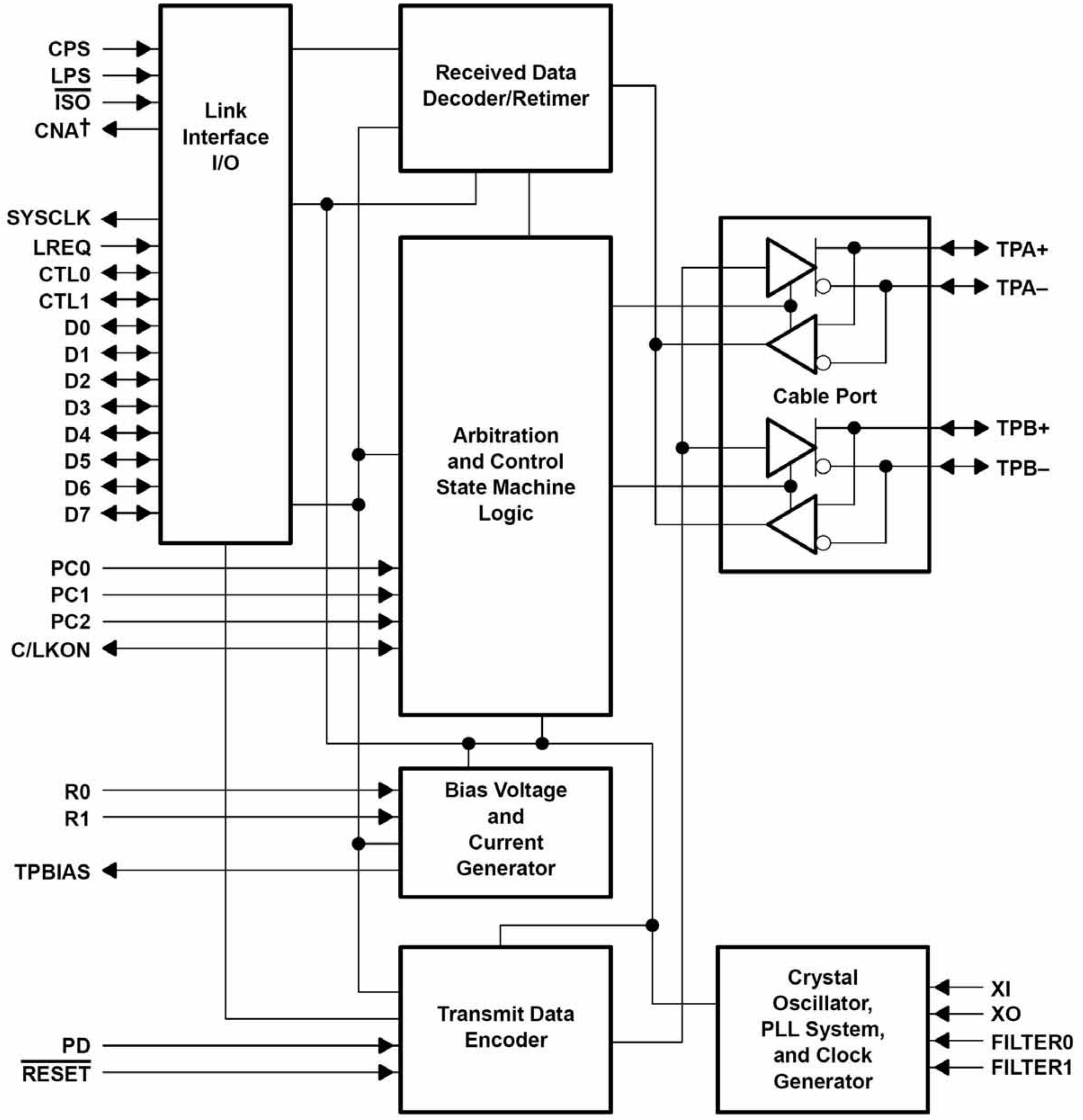
8-3 AIC1 (PCM1742) Block Diagram


BCK
LRCK
DATA
ML
MC
MD
SCK
Audio Serial Port
Serial Control Port
System Clock Manager
System Clock
4x/8x Oversampling Digital Filter with Function Controller
Enhanced Multilevel Delta-Sigma Modulator
DAC
DAC
Output Amp and Low-Pass Filter
Output Amp and Low-Pass Filter
VOUTL
VCOM
VOUTR
Zero Detect
Power Supply
ZEROL
ZEROR
VDD
DGND
VCC
AGND

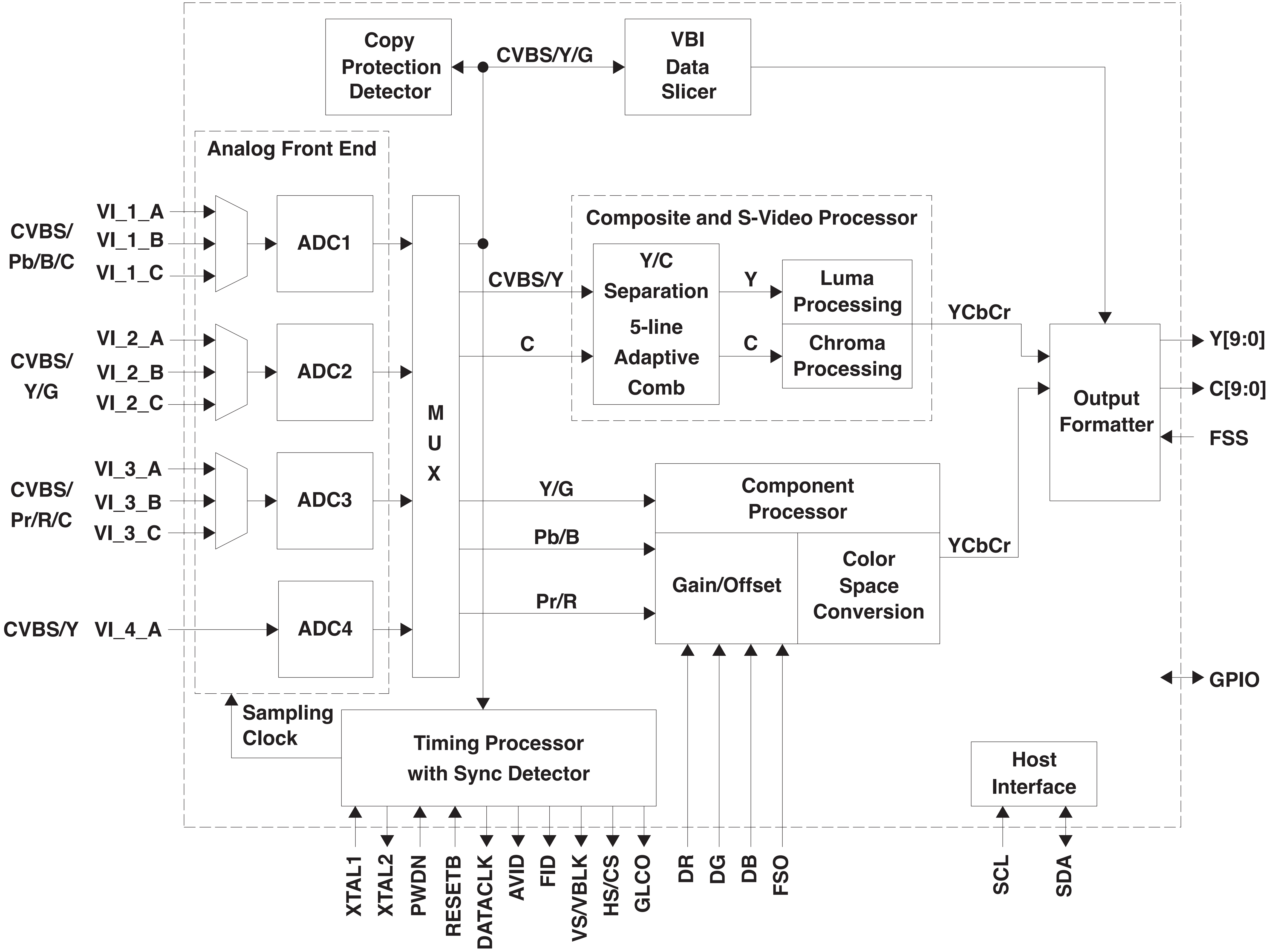
8-4 AIC9 (PCM1802) Block Diagram


VINL
VREF1
VREF2
VINR
Single-End /Differential Converter
Reference
Single-End /Differential Converter
5th Order Delta-Sigma Modulator
5th Order Delta-Sigma Modulator
×1/64 (×1/128) Decimation Filter with DC Cut Filter
Serial Interface
Mode/ Format Control
Clock and Timing Control
Power Supply
BCK
LRCK
FSYNC
DOUT
FMT0
FMT1
MODE0
MODE1
BYPAS
OSR
PDWN
SCKI
VCC
AGND
DGND
VDD

8-5 PIC1 (TSB4AB1) Block Diagram

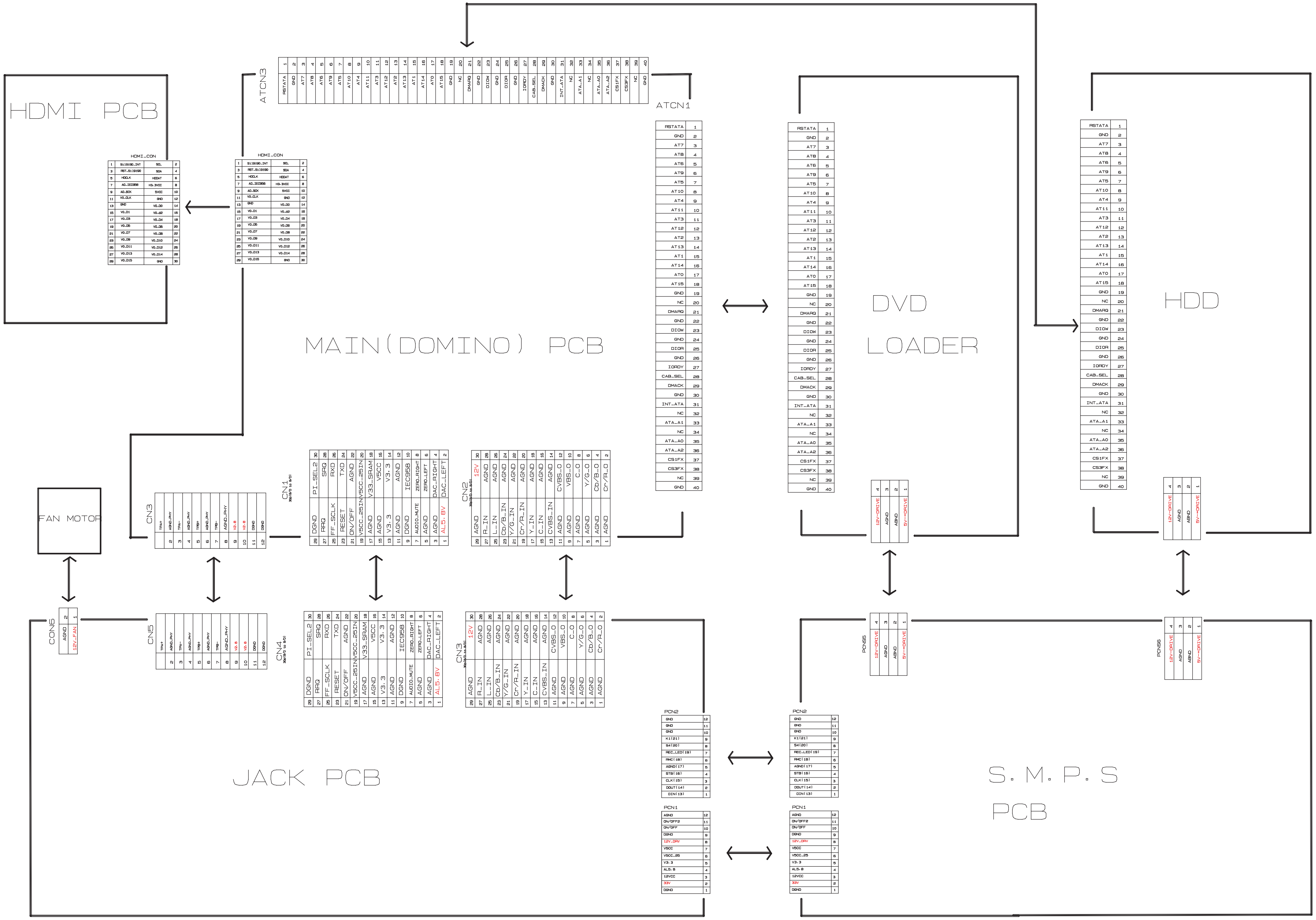

CPS
LPS
ISO
CNA†
SYSCLK
LREQ
CTL0
CTL1
D0
D1
D2
D3
D4
D5
D6
D7
PC0
PC1
PC2
C/LKON
R0
R1
TPBIAS
PD
RESET
Link Interface I/O
Received Data Decoder/Retimer
Arbitration and Control State Machine Logic
Bias Voltage and Current Generator
Transmit Data Encoder
Cable Port
TPA+
TPA–
TPB+
TPB–
Crystal Oscillator, PLL System, and Clock Generator
XI
XO
FILTER0
FILTER1

8-6 TIC1 (TVP5146) Block Diagram


Copy Protection Detector
CVBS/Y/G
VBI Data Slicer
Analog Front End
CVBS/ Pb/B/C
VI_1_A
VI_1_B
VI_1_C
ADC1
CVBS/ Y/G
VI_2_A
VI_2_B
VI_2_C
ADC2
CVBS/ Pr/R/C
VI_3_A
VI_3_B
VI_3_C
ADC3
CVBS/Y
VI_4_A
ADC4
MUX
Composite and S-Video Processor
CVBS/Y
C
Y/C Separation 5-line Adaptive Comb
Y
C
Luma Processing
Chroma Processing
YCbCr
Output Formatter
Y[9:0]
C[9:0]
FSS
Y/G
Pb/B
Pr/R
Component Processor
Gain/Offset
Color Space Conversion
YCbCr
GPIO
Sampling Clock
Timing Processor with Sync Detector
Host Interface
XTAL1
XTAL2
PWDN
RESETB
DATACLK
AVID
FID
VS/VBLK
HS/CS
GLCO
DR
DG
DB
FSO
SCL
SDA

MEMO

9. Wiring Diagram



HDMI PCB
HDMI_CON
ATCN3
ATCN1
MAIN(DOMINO) PCB
DVD LOADER
HDD
FAN MOTOR
CN3
CN1
CN2
CON6
AGND
12V_FAN
CN5
CN4
CN3
JACK PCB
PCN2
PCN1
PCN55
PCN56
12V_DRIVE
AGND
5V_DRIVE
S. M. P. S PCB
RSTATA
GND
AT7
AT8
AT6
AT9
AT5
AT10
AT4
AT11
AT3
AT12
AT2
AT13
AT1
AT14
AT0
AT15
NC
DMARQ
DIOW
DIOR
IORDY
CAB_SEL
DMACK
INT_ATA
ATA_A1
ATA_A0
ATA_A2
CS1FX
CS3FX

MEMO

10. PCB Diagrams

10-1 S.M.P.S. PCB - 10-2

10-2 Main PCB - 10-4

10-3 Jack PCB - 10-6

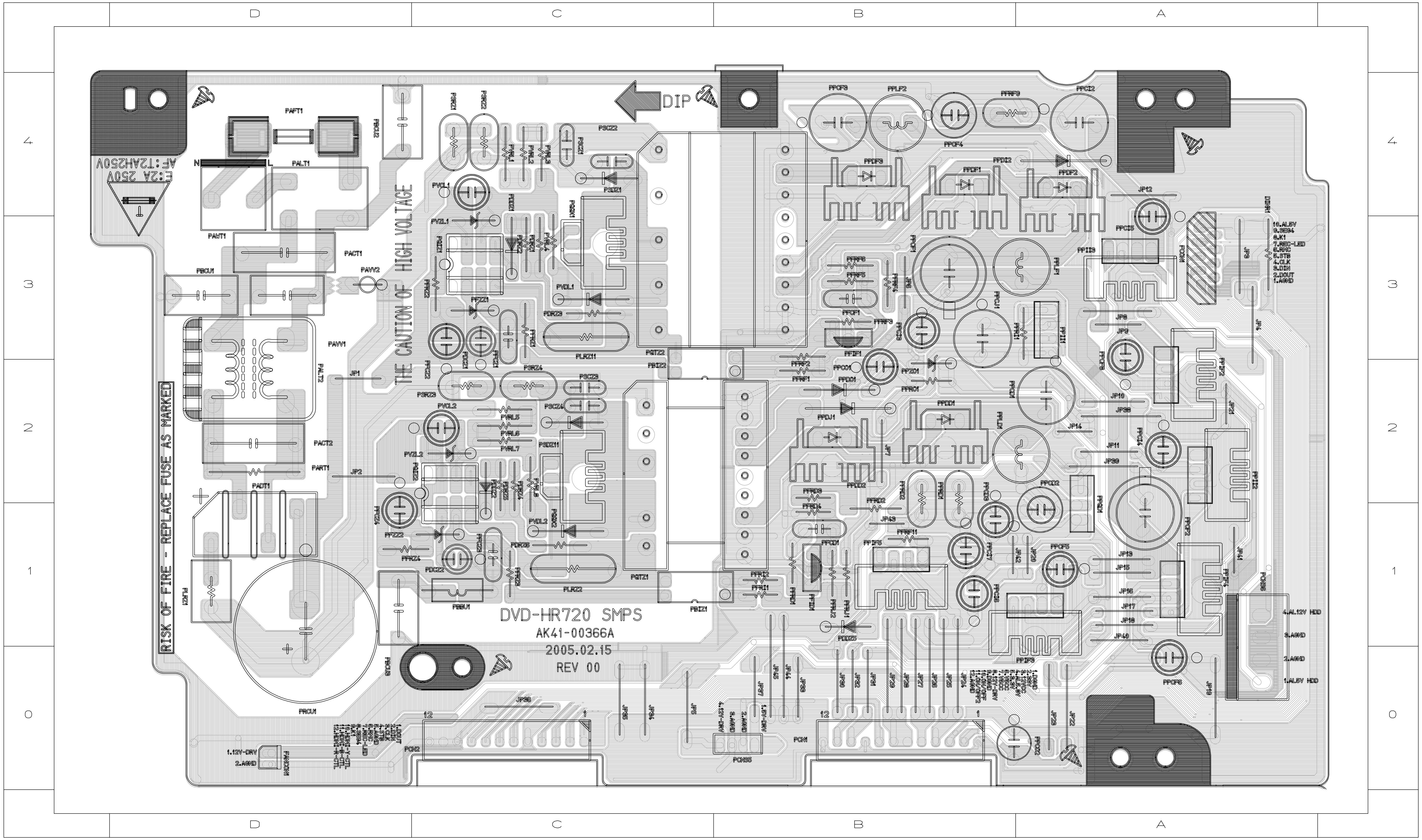
10-4 Right Key PCB - 10-8

10-5 Left Key PCB - 10-8

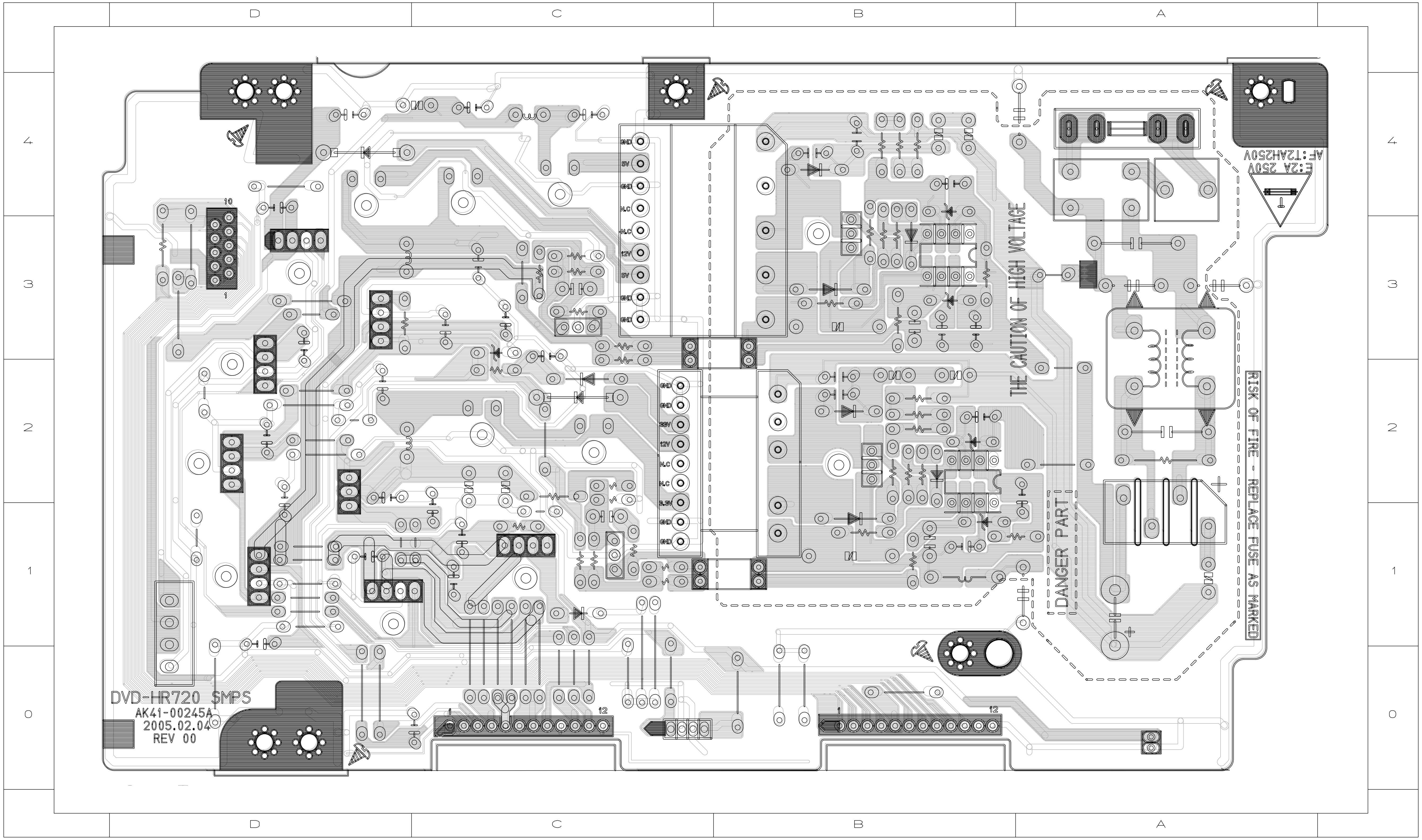
10-6 HDMI Sub PCB - 10-9

10-1 S.M.P.S. PCB

COMPONENT SIDE

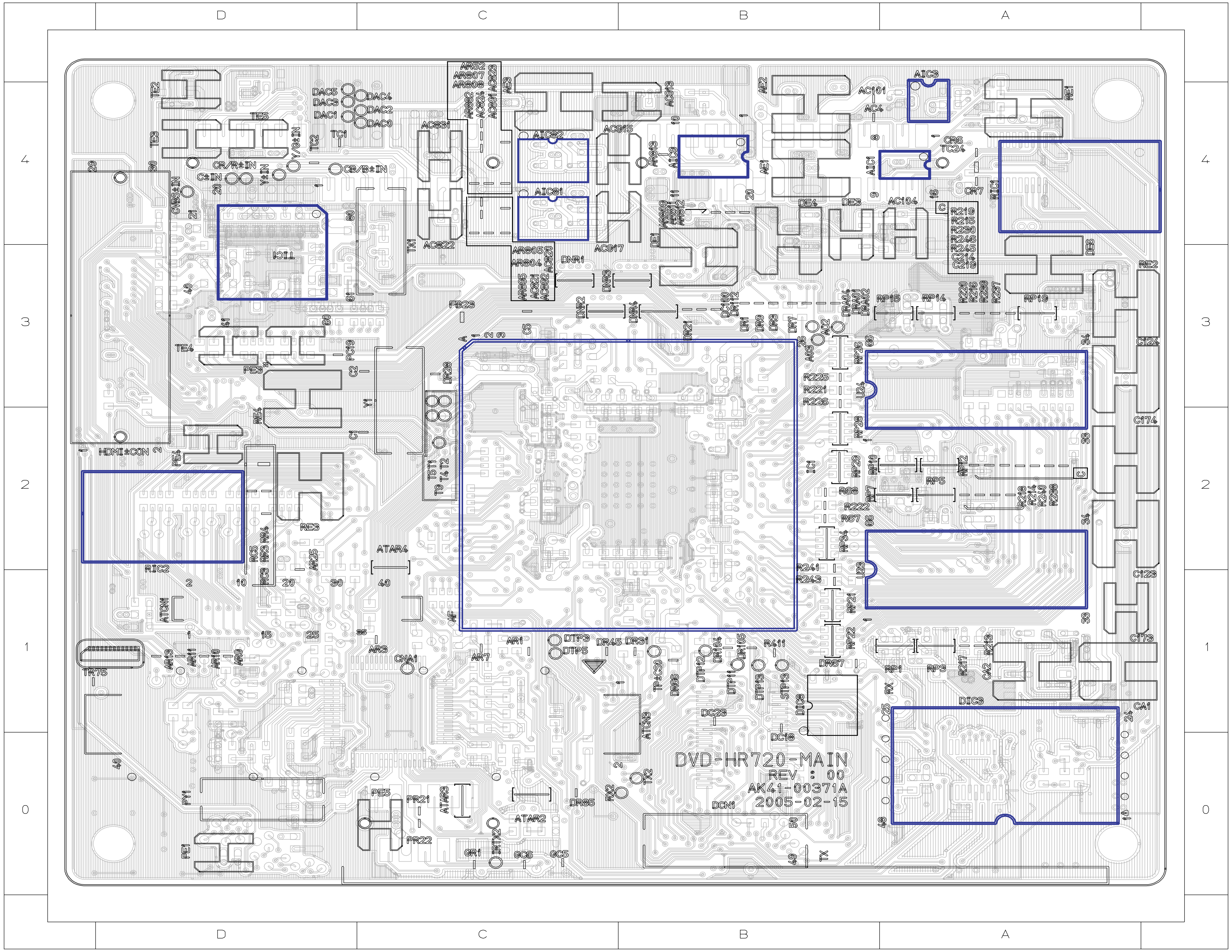

D
C
B
A
4
3
2
1
0
DIP
THE CAUTION OF HIGH VOLTAGE
RISK OF FIRE - REPLACE FUSE AS MARKED
F:2A 250V
AF:T2AH250V
DVD-HR720 SMPS
AK41-00366A
2005.02.15
REV 00
12
1
12
1

CONDUCTOR SIDE

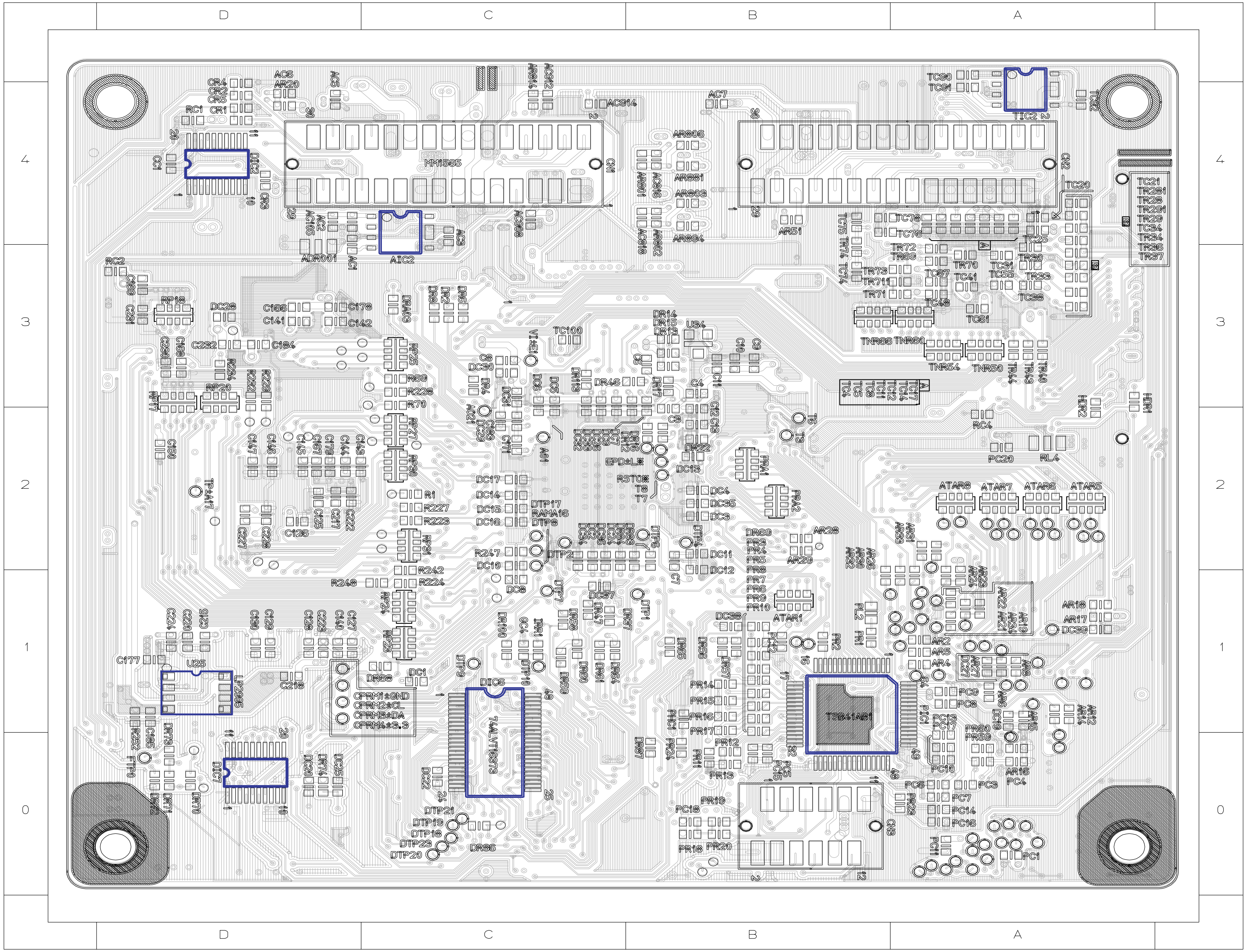

D
C
B
A
4
3
2
1
0
THE CAUTION OF HIGH VOLTAGE
DANGER PART
RISK OF FIRE - REPLACE FUSE AS MARKED
F:2A 250V
AF:T2AH250V
GND
5V
GND
NLC
NLC
12V
5V
GND
GND
GND
GND
33V
12V
NLC
NLC
3.3V
GND
GND
10
1
1
12
1
12
DVD-HR720 SMPS
AK41-00245A
2005.02.04
REV 00

10-2 Main PCB

COMPONENT SIDE

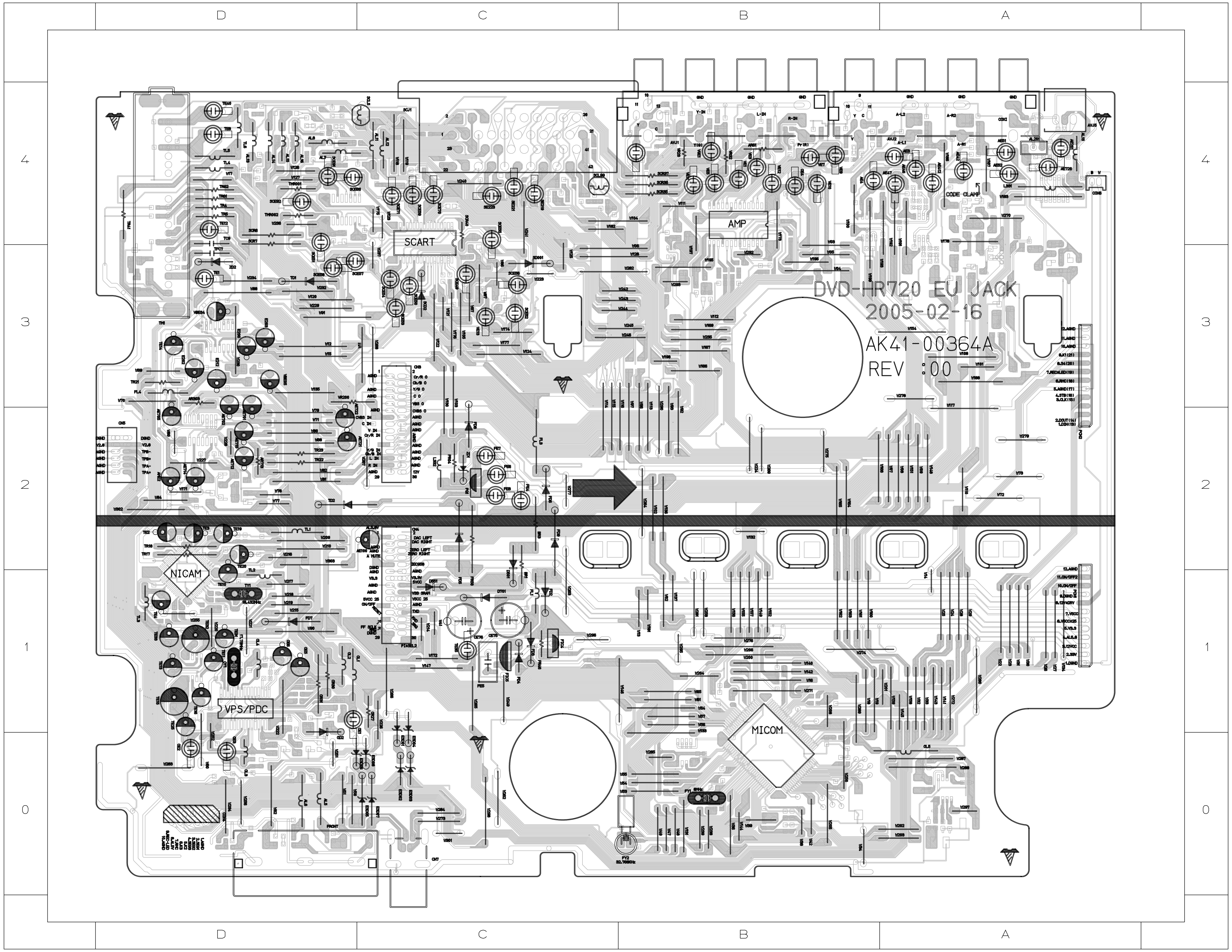

D
C
B
A
4
3
2
1
0
DVD-HR720-MAIN
REV : 00
AK41-00371A
2005-02-15
TE2
TE3
TE5
TE4
DAC5
DAC3
DAC1
DAC4
DAC2
DAC0
TC1
TC2
Y/G±IN
CR/R±IN
C±IN
Y±IN
CB/B±IN
CVBS±IN
IC11
TX1
AC831
AC822
AIC82
AIC81
AC915
AC917
AE3
AC913
AIC3
AC101
AC4
AIC1
AIC9
AC104
CR6
TC24
CR7
RIC1
AE1
AE2
DE4
DE3
DE1
DE2
DNR1
DNR2
DNR3
DNR4
FB29
RE1
RE2
RP15
RP14
RP19
C124
C174
C123
C173
IC1
U24
U23
RP5
R222
R241
R243
R225
R221
R226
PE3
PE4
RE4
RE3
RIC2
HDMI±CON
ATAR4
ATAR2
ATAR3
ATCN1
AR3
AR7
AR1
CNA1
DTP5
DR45
DRS1
R411
DR57
DIC5
DC25
DC18
DCN1
DRS5
TR75
PY1
PE1
PE5
PR21
PR22
GR1
GC6
GC5
RPS
RP1
DIC3
CA1
CA2
Y1
C1
C2
PC19
TX
RX

CONDUCTOR SIDE

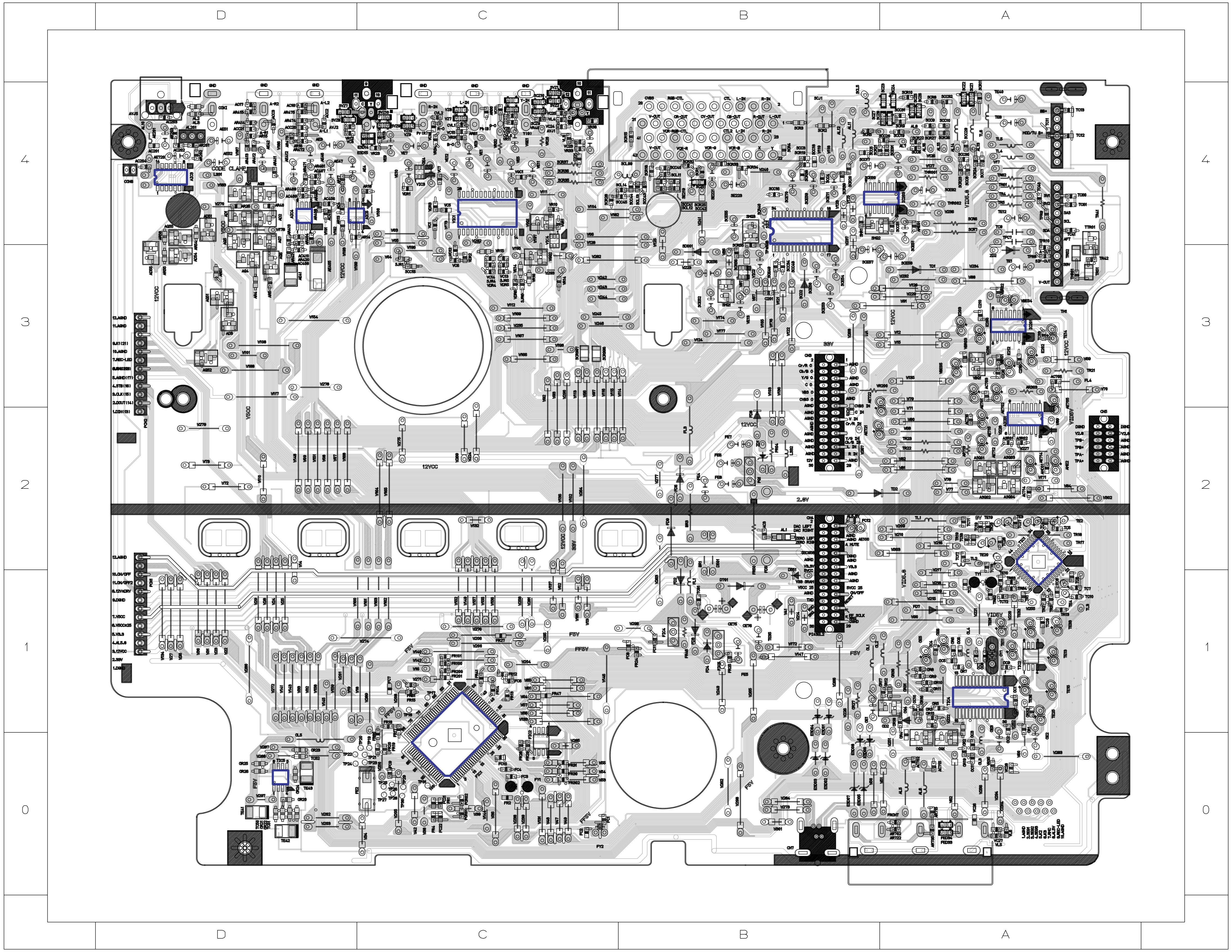

D
C
B
A
4
3
2
1
0
MM1565
CN1
CN2
AIC2
DIC6
74ALVT16373
T3B41A01
U25
CN3
CPRM1:GND
CPRM2:CL
CPRM3:DA
CPRM4:3.3

10-3 Jack PCB

COMPONENT SIDE

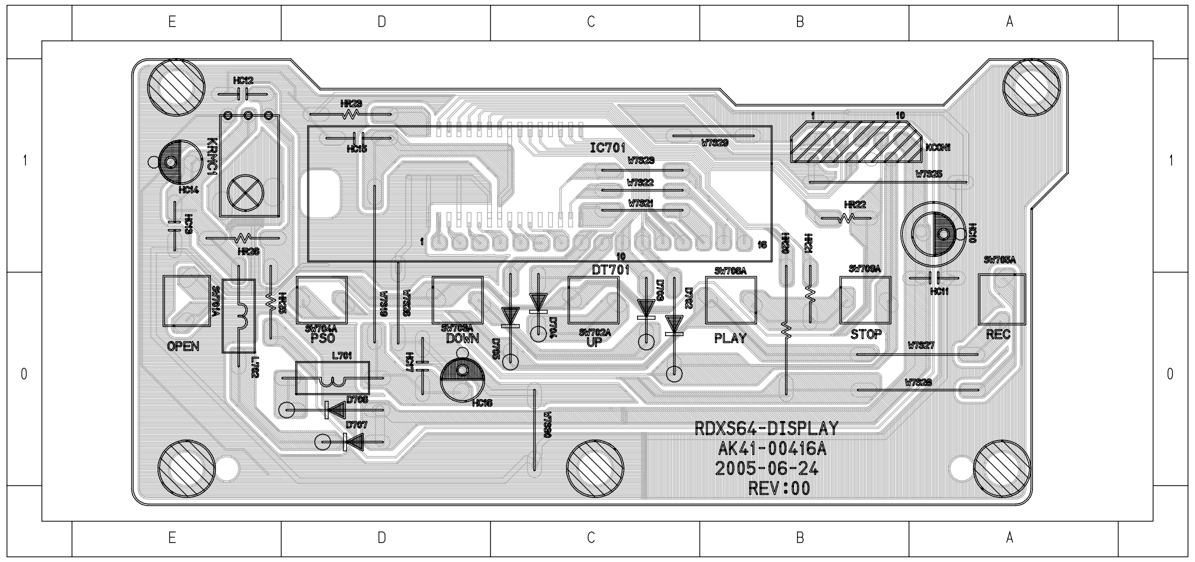

D
C
B
A
4
3
2
1
0
SCART
AMP
DVD-HR720 EU JACK
2005-02-16
AK41-00364A
REV 00
NICAM
VPS/PDC
MICOM

CONDUCTOR SIDE

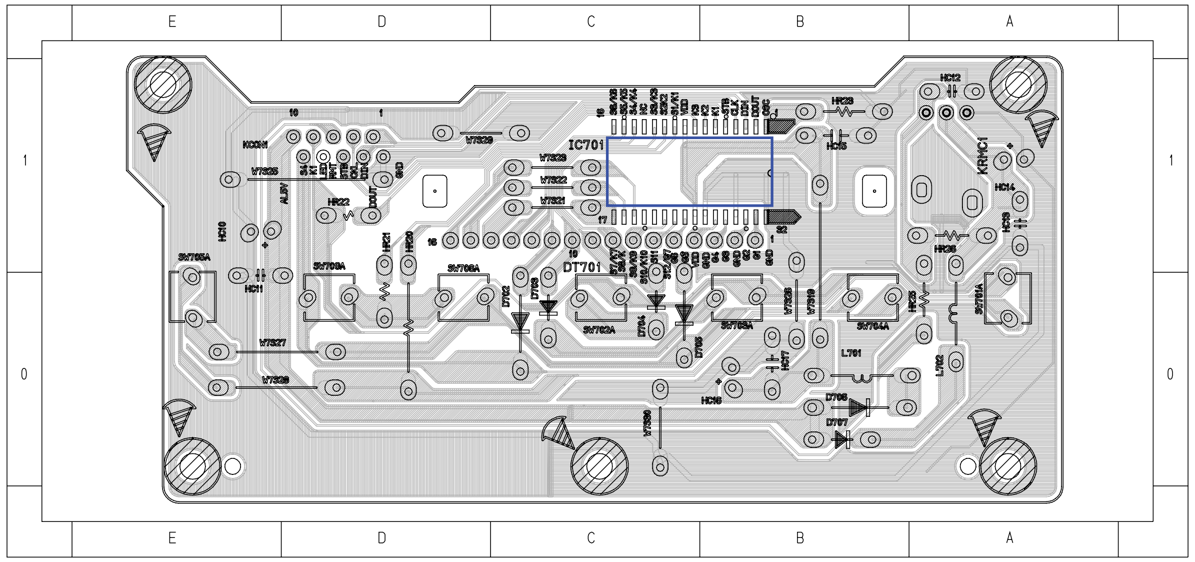


10-4 Right Key PCB

COMPONENT SIDE

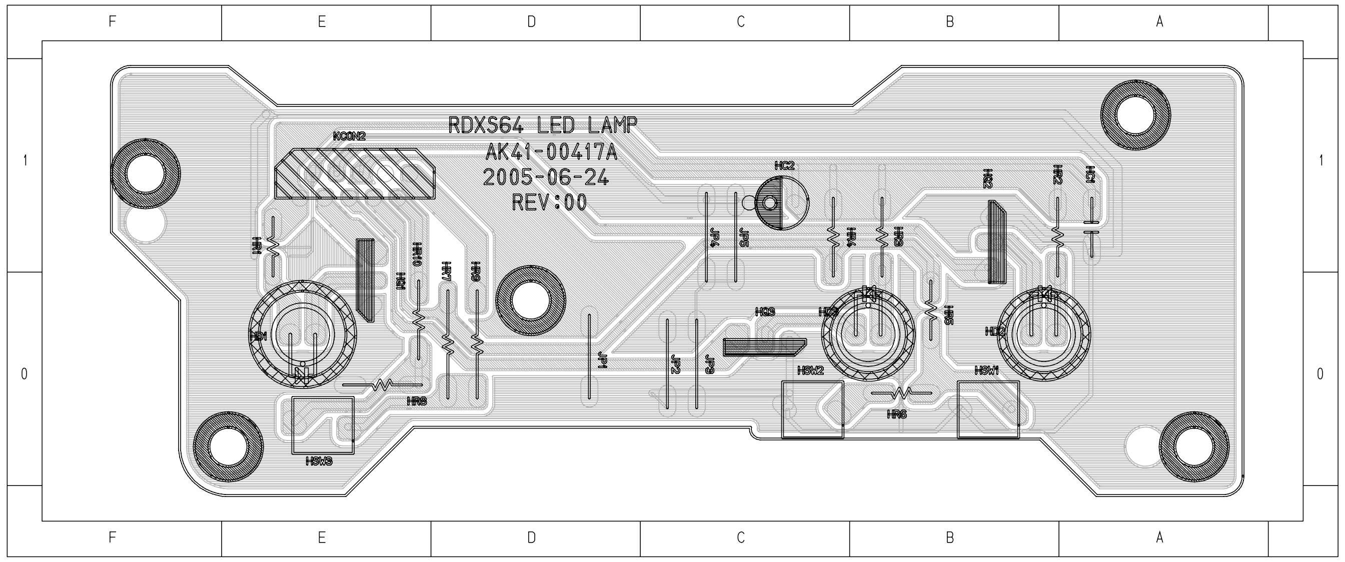

E
D
C
B
A
1
0
IC701
DT701
KRMC1
OPEN
PSO
DOWN
UP
PLAY
STOP
REC
RDXS64-DISPLAY
AK41-00416A
2005-06-24
REV:00

CONDUCTOR SIDE

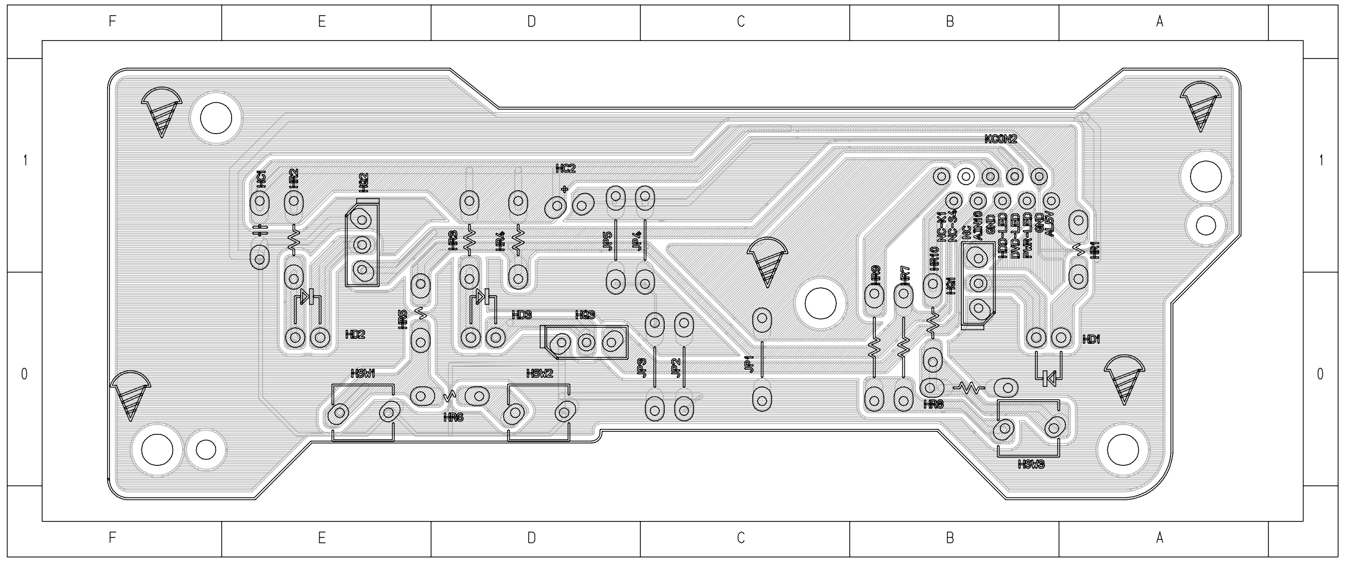

E
D
C
B
A
1
0
IC701
DT701
KRMC1

10-5 Left Key PCB

COMPONENT SIDE

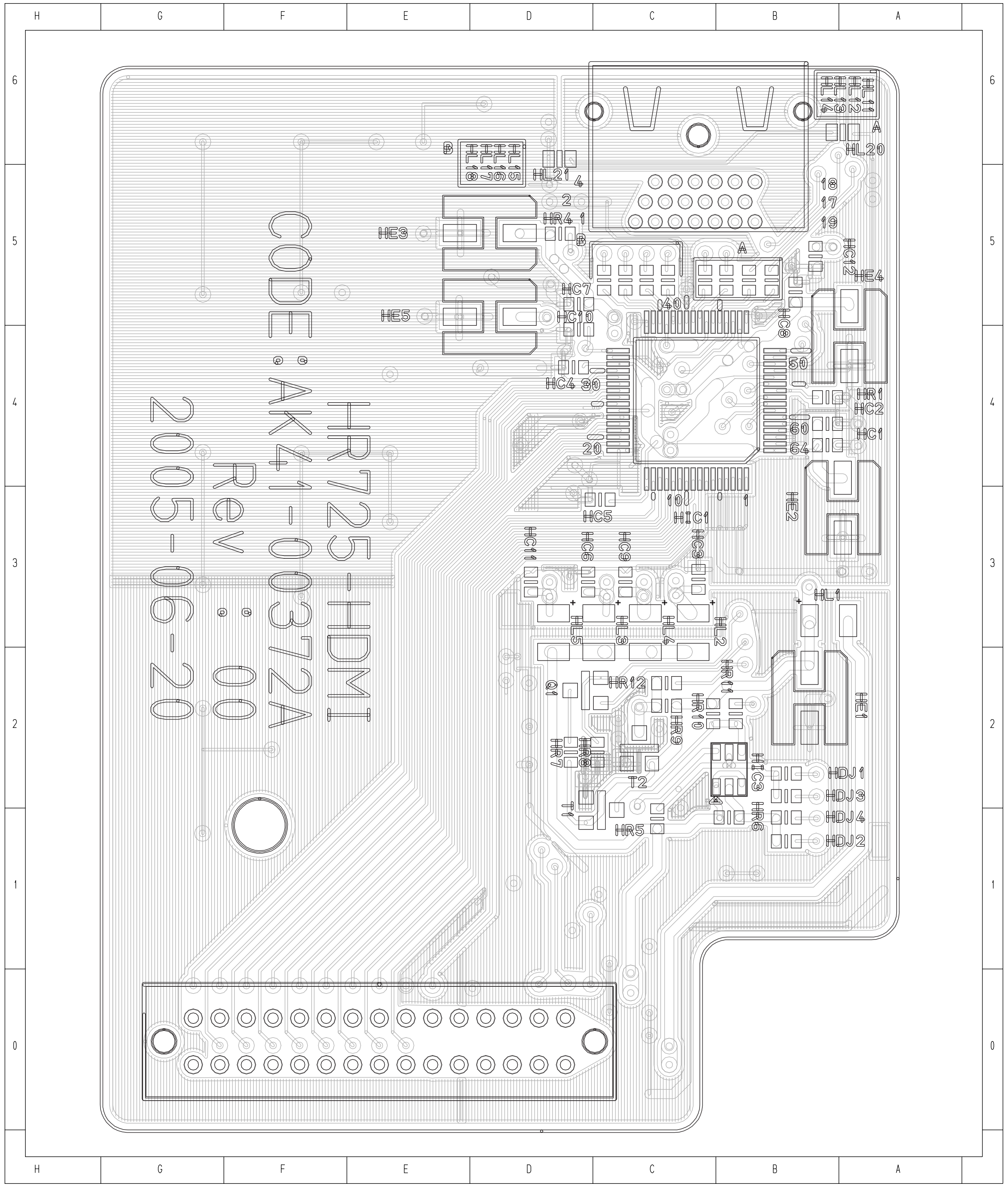

F
E
D
C
B
A
1
0
RDXS64 LED LAMP
AK41-00417A
2005-06-24
REV:00

CONDUCTOR SIDE

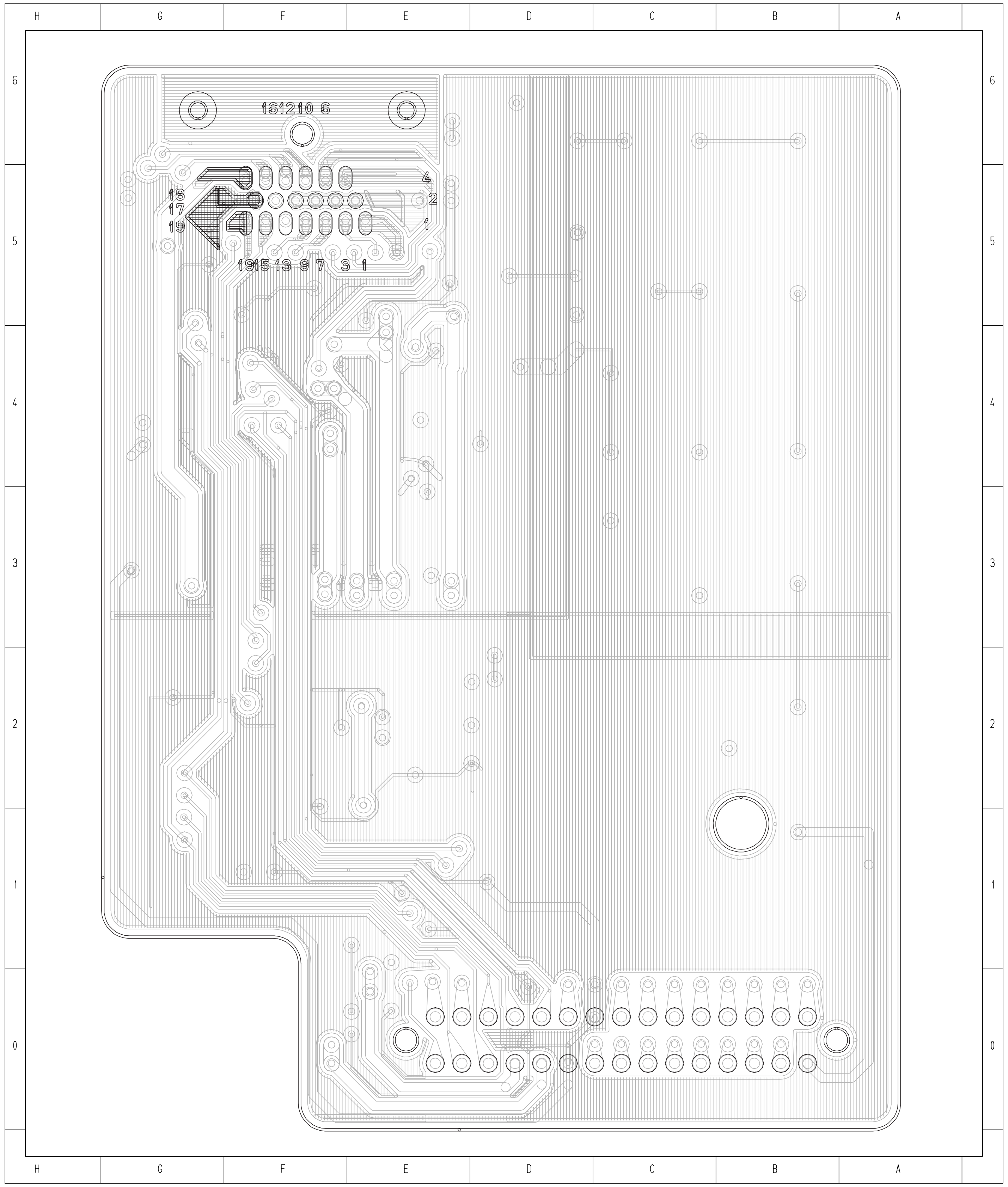


10-6 HDMI Sub PCB

COMPONENT SIDE

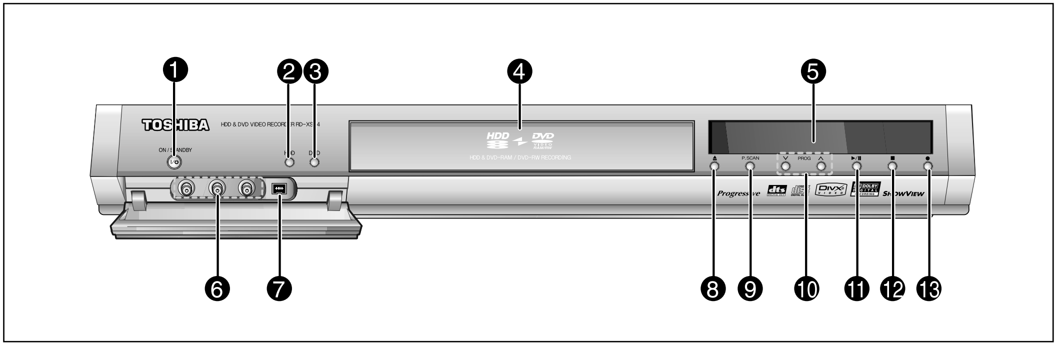

H
G
F
E
D
C
B
A
6
5
4
3
2
1
0
HR725-HDMI
CODE:AK41-00372A
Rev : 00
2005-06-20
HE1
HE2
HE3
HE4
HE5
HIC1
HIC3
HC1
HC2
HC4
HC5
HC6
HC7
HC8
HC9
HC10
HC11
HC12
HL1
HL2
HL3
HL4
HL5
HL20
HL21
HR1
HR4
HR5
HR6
HR7
HR8
HR9
HR10
HR11
HR12
Q1
T1
T2
HDJ1
HDJ2
HDJ3
HDJ4
A
B
1
2
4
10
17
18
19
20
30
40
50
60
64

CONDUCTOR SIDE


H
G
F
E
D
C
B
A
6
5
4
3
2
1
0
16 12 10 6
18
17
19
4
2
1
19 15 13 9 7 3 1

Description

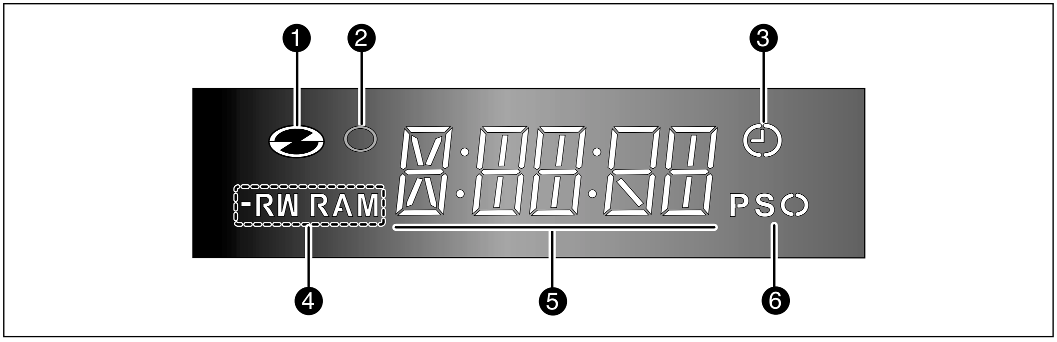
Front Panel


1
2
3
4
5
TOSHIBA
HDD & DVD VIDEO RECORDER RD-XS34
ON / STANDBY
HDD
DVD
P.SCAN
PROG
Progressive
ShowView
6
7
8
9
10
11
12
13

1. **ON/STANDBY BUTTON**
   Turns the recorder on and off.
2. **HDD BUTTON**
   Selects HDD mode.
3. **DVD BUTTON**
   Selects DVD mode.
4. **DISC TRAY**
   Opens to accept a disc.
5. **DISPLAY**
   Displays the playing status, title/ chapter/ time, etc.
6. **AV 3 IN**
   Connect external equipment.
7. **DV IN**
   Connects external digital equipment with a DV jack. (such as a camcorder)
8. **OPEN/CLOSE BUTTON**
   Opens and closes the disc tray.
9. **P.SCAN BUTTON**
   Selects the progressive scan mode.
10. **PROG ∧∨ BUTTONS**
    Select TV preset Channels. Same as **PROG** button on the remote control.
11. **PLAY/PAUSE BUTTON**

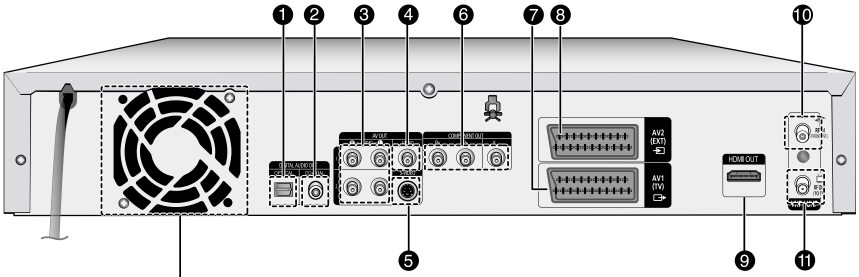
    Plays a disc or pauses playback or recording.
12. **STOP BUTTON**
    Stops disc playback.
13. **REC BUTTON**
    Starts recording.

Front Panel Display


1
2
3
-RW RAM
PSO
4
5
6

1. Lights when a disc is loaded.
2. Lights in the record mode.
3. Lights to indicate the timer record mode.
4. Lights when a DVD-RAM/-RW/-R disc is loaded.
5. Playing time/clock/current status indicator.
6. Lights in the progressive scan mode.

Rear Panel



Fan
The fan always revolves when the power is on.
Ensure a minimum of 10cm clear space on all sides of the fan when installing the product.

1. DIGITAL AUDIO OUT(OPTICAL)

Connects to an amplifier having a digital optical audio input jack.

2. DIGITAL AUDIO OUT(COAXIAL)

Connects to an amplifier having a digital coaxial audio input jack.

3. AUDIO OUT

Connects to the audio input of external equipment using audio cables.

4. VIDEO OUT

Connects to the input of external equipment using a Video cable.

5. S-VIDEO OUT

Connects to the input of external equipment using an S-Video cable.

6. COMPONENT VIDEO OUT

Connects to equipment having Component video input.

7. AV1(TV) OUTPUT SCART Connector

8. AV2(EXT) INPUT SCART Connector

9. HDMI OUT

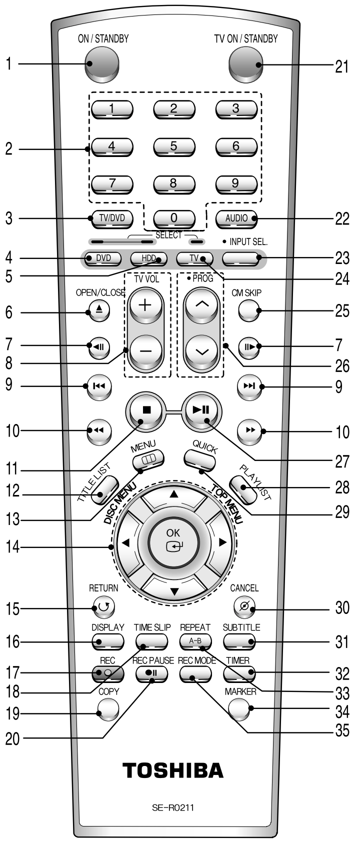
10. 📡 In from aerial connector

11. 📺 Out to TV connector

NOTE

- The Antenna connection does not pass output signal of DVD. To watch a DVD on your TV, you must connect audio/video or Scart cables.

Tour of the Remote Control


ON / STANDBY
TV ON / STANDBY
1
2
3
4
5
6
7
8
9
0
TV/DVD
AUDIO
SELECT
• INPUT SEL.
DVD
HDD
TV
TV VOL
• PROG
OPEN/CLOSE
CM SKIP
MENU
QUICK
TITLE LIST
PLAY LIST
DISC MENU
TOP MENU
OK
RETURN
CANCEL
DISPLAY
TIME SLIP
REPEAT
A-B
SUBTITLE
REC
REC PAUSE
REC MODE
TIMER
COPY
MARKER
TOSHIBA
SE-R0211
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
7
26
9
10
27
28
29
30
31
32
33
34
35

1. **ON/STANDBY Button**
2. **NUMBER Buttons**
3. **TV/DVD Button**
4. **DVD Button**
   Press this to operate DVD.
5. **HDD Button**
   Press this to operate HDD.
6. **OPEN/CLOSE Button**
   To open and close the disc tray.
7. **REVERSE/FORWARD STEP Buttons**
   Each press will play one-frame reverse or forward.
8. **TV VOL Button**
   TV volume adjustment
9. **REVERSE/FORWARD SKIP Buttons**
   Press to skip a disc backwards or forwards.
10. **REVERSE/FORWARD SEARCH Buttons**
    Press to search a disc backwards or forwards.
11. **STOP Button**
    Press to stop a disc or HDD playback.
12. **TITLE LIST/DISC MENU Button**
    Use this to enter the View Recording list/disc menu.
13. **MENU Button**
    Shows the HDD & DVD RECORDER's setup menu.
14. **OK/DIRECTION Buttons** (▲▼◀ ▶ Buttons)
15. **RETURN Button**
16. **DISPLAY Button**
    This will display current setting or status of disc or HDD.
17. **REC Button**
    Use to make a recording on HDD/DVD-RAM/-RW/-R discs.
18. **TIME SLIP Button**
    Use this to watch the recently recorded images on the screen while a recording is in progress, with a 10 second delay.
19. **COPY Button**
    Press this when you copy DVD to HDD or HDD to DVD. To start copy, press the **COPY** button during the playback.
20. **REC PAUSE Button**
    Use this to pause during recording.
21. **TV ON/STANDBY Button**
22. **AUDIO Button**
    Use this to access various audio functions on a disc (DVD mode).
23. **INPUT SEL. Button**
    Select input signal in external input mode (PROG, AV1, AV2, AV3 or DV input)
24. **TV Button**
    Press this to operate TV.
25. **CM SKIP Button**
    When a programme recorded on DVD disc or HDD is played, the unit can be set to automatically skip a portion of the programme.
26. **PROG Button**
    Use this to select a TV programme.
27. **PLAY/PAUSE Button**
    Press to play/pause a disc or HDD.
28. **PLAY LIST/TOP MENU Button**
    Use this to return to the Title menu, or to view the recorded files list.
29. **QUICK Button**
    View and select the applicable features under current status.
30. **CANCEL Button**
31. **SUBTITLE Button**
    Press this to switch the DVD's subtitle language.
32. **TIMER Button**
    Press to enter the Timer Recording Mode menu directly.
33. **REPEAT A-B Button**
    Allows you to repeat playback between point A and point B.
34. **MARKER Button**
    Use this to bookmark a position while playing a disc or HDD.
35. **REC MODE Button**
    Use this to set the desired Recording time and picture quality (XP/SP/LP/EP).

Connecting & Setting Up

This section involves various methods of connecting the HDD & DVD RECORDER to other external components and required initial setting modes.

Quick Overview 18
Connecting the HDD & DVD RECORDER 19
Additional connections 19
Antenna + HDD & DVD RECORDER +
External decoder box + TV 20
Other type of connecting the Video output cable . .20
Other type of connecting the Audio output cable . .22
Connecting HDMI/DVI to a TV 23
Connecting to AV 3 IN, DV input jack 24

Quick Overview

A Quick Overview presented in this guide will give you enough information to start using the recorder.

Connecting the HDD & DVD RECORDER

▼

Additional connections

▼

Antenna + HDD & DVD RECORDER + External decoder box + TV

▼

Other type of connecting the Video output cable

▼

Other type of connecting the Audio output cable

▼

Connecting HDMI/DVI to a TV

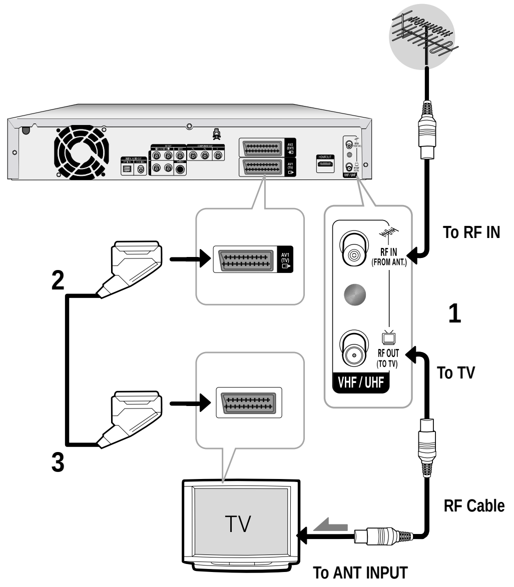
▼

Connecting to AV 3 IN, DV input jack

Connecting the HDD & DVD RECORDER

You can connect your HDD & DVD RECORDER to the television using the SCART cable if the appropriate input is available on the television.

1. Connect the RF cable as shown.
2. Connect one end of the SCART cable to the AV1 socket on the rear of the HDD & DVD RECORDER.
3. Plug the other end into the appropriate connector on the television.
4. Plug in the HDD & DVD RECORDER and TV
5. Turn on the HDD & DVD RECORDER and TV.
6. Press the **INPUT SEL.** button on your TV remote control until the Video signal from the HDD & DVD RECORDER appears on the TV screen.

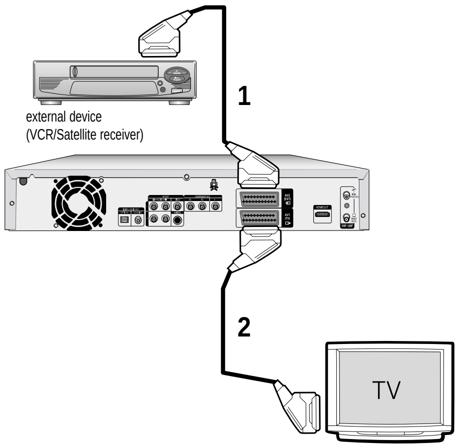


NOTE

- The RF cable connection of this product sends only signals of TV. You must connect SCART cable or Audio/Video cables to watch a DVD from your HDD & DVD RECORDER.
- Press the **TV/DVD** button on remote control, then "TV" appear on Front LED display (or turn off HDD & DVD RECORDER). Then you can watch programmes received through RF cable.
- All video output decoded by this unit will disable teletext information. For teletext viewing, turn off this unit and select the RF channel of your TV using TV remote control.

Additional connections

You can connect your HDD & DVD RECORDER to a satellite or digital tuner.



- DVD mode

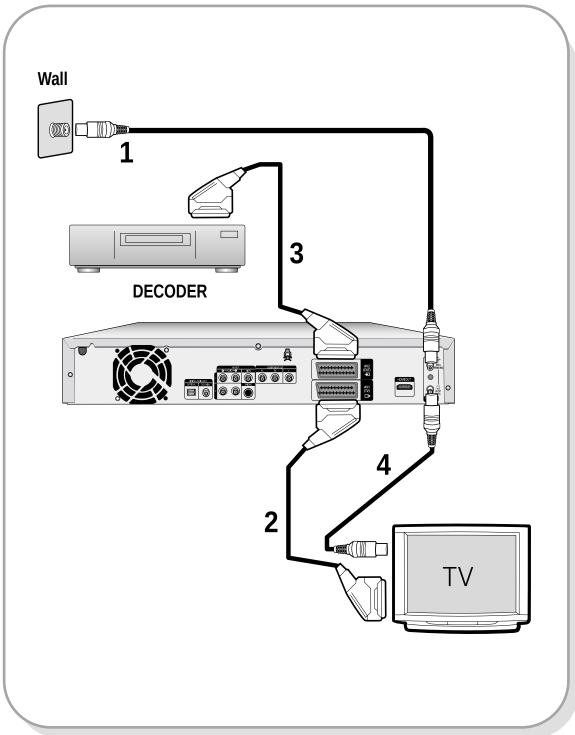
1. Connect the AV2 connector of HDD & DVD RECORDER and VCR/Satellite receiver or digital tuner using a SCART cable.
2. Connect the AV1 connector to the SCART AV connector on TV.
3. Turn on the HDD & DVD RECORDER, VCR/Satellite receiver or digital tuner and TV.
4. Set Input mode on AV2.

- TV mode

1. Press the **TV/DVD** button on remote control,then "TV" appear on Front LED display. (or turn off HDD & DVD RECORDER.)
2. You can watch programmes from a satellite or digital tuner connected to this HDD & DVD RECORDER, even when the HDD & DVD RECORDER is turned off.

Antenna + HDD & DVD RECORDER + External decoder box + TV

If you connect external decoder box to HDD & DVD RECORDER, you can record scrambled channels (CANAL+or Premiere broadcasts) received through the built-in TV tuner in HDD & DVD RECORDER.



1. Connect RF antenna cables as shown.
2. Connect the AV1 connector on this recorder to the SCART AV connector on TV using a SCART cable.
3. Connect the AV2 connector to a SCART AV connector on decoder box.
4. To watch or record PAY-TV Canal Plus programmes, set your HDD & DVD RECORDER to receive the channels using the on-screen display. (See page 30.)

Other type of connecting the Video output cable

There are several ways to output video signal not using scart cables. Select one of the following video connecting that best suits you below.

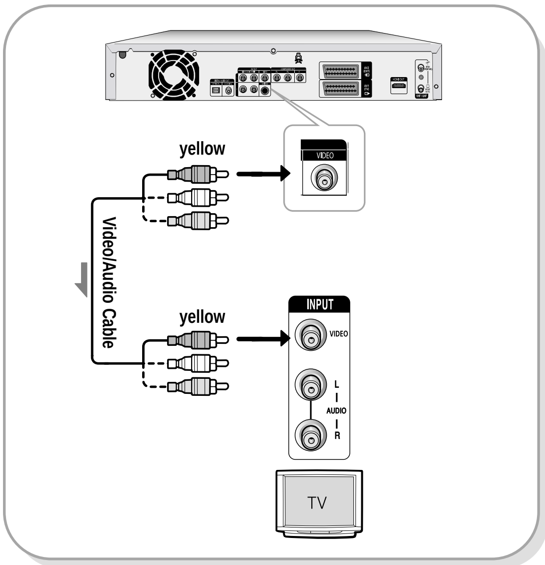
- **Case 1 :** Connecting to a Video (Composite) output jack
- **Case 2 :** Connecting to an S-Video output jack
- **Case 3 :** Component Video output jacks

S-Video, Component video and Progressive Output Modes

- S-Video and Component video output are available only if your TV supports S-Video input or Component video input, respectively. If S-Video or Component video output does not work, check the TV connections and the TV input selection settings.
- Compared to standard interlaced video, progressive scan doubles the amount of video lines fed to your TV, resulting in a more stable, flicker-free, clear image than interlaced video.
  This is only available with TVs that support progressive scan.
- Progressive Scan Output (576p)
  Consumers should note that not all high definition television sets are fully compatible with this product and may cause artifacts to be displayed in the picture, in case of 576 progressive scan picture problems, It is recommended that the user switch the connection to the ‘standard definition’ output. If there are questions regarding our TV set compatibility with this model 576p HDD & DVD RECORDER, please contact our customer service centre.

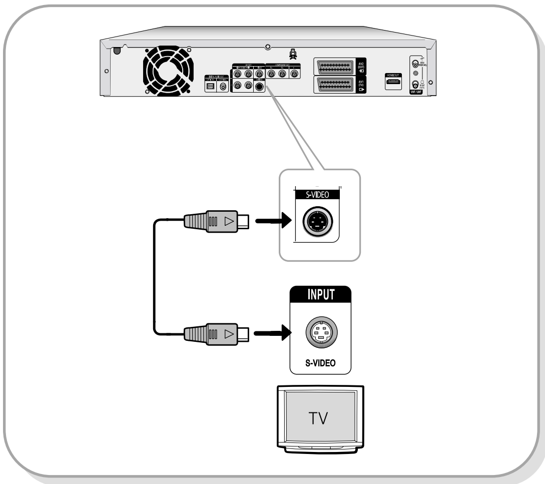
Case 1 : Connecting to a Video (Composite) output jack

1. Connect a video(yellow) cable between the VIDEO (yellow) OUT jack on HDD & DVD RECORDER and VIDEO (yellow) INPUT jack on your TV (or AV amplifier).
   - You will enjoy regular quality images.
2. Connect audio cables (white and red) between the AUDIO OUT jacks on the HDD & DVD RECORDER and AUDIO IN jacks on TV (or AV amplifier). (See page 22.)



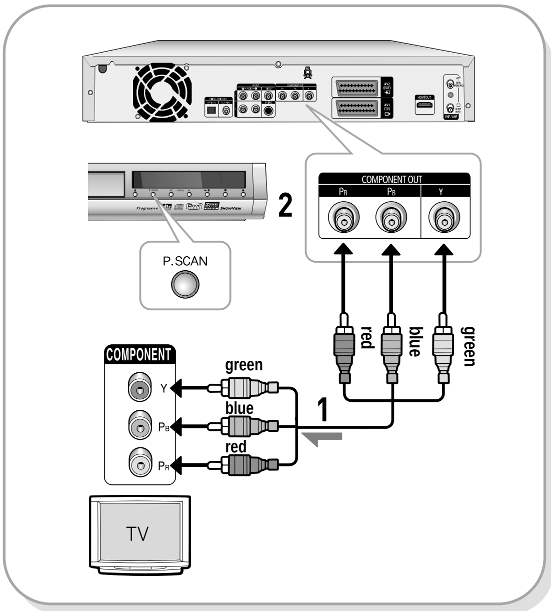
Case 2 : Connecting to an S-Video output jack

1. Connect an S-Video cable (not supplied) between the S-VIDEO OUT jack on HDD & DVD RECORDER and S-VIDEO INPUT jack on your TV (or AV amplifier).
   - You will enjoy high quality images.
2. Connect audio cables (white and red) between the AUDIO OUT jacks on HDD & DVD RECORDER and AUDIO IN jacks on TV (or AV amplifier). (See page 22.)



Case 3 : Component Video output jacks

1. Connect Component video cables(not supplied) between the COMPONENT OUT(Y,P_B,P_R) jacks on HDD & DVD RECORDER and COMPONENT IN(Y,P_B,P_R) jacks on your TV.
   - You will enjoy high quality and accurate colour reproduction images.
2. Connect audio cables (white and red) between the AUDIO OUT jacks on the HDD & DVD RECORDER and AUDIO IN jacks on TV (or AV amplifier). (See page 22.)
   Press the input selection on your TV remote control until the Component signal from the HDD & DVD RECORDER appears on your TV screen.
3. After connecting, refer to the pages 41~43.



NOTE

- Consult your TV User's Manual to find out if your TV supports Progressive Scan.
  If Progressive Scan is supported, follow the TV User's Manual regarding Progressive Scan settings in the TV's menu system.
- Make sure that the colour coded connections match. The Y, PB, PR component output jacks of your HDD & DVD RECORDER must be connected to the exact corresponding component input jacks on your TV.
- Progressive setting is only available when the Video Out is set to Component.
  (See pages 41~43.)
- You can switch from the component output to other output only in stop mode.

Other type of connecting the Audio output cable

There are several ways to output audio signal beside using scart cables. Select the audio connection that best suits you below.

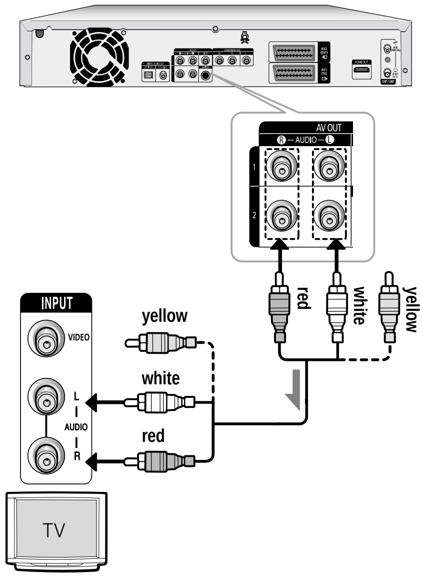
- **Case 1 :** Connecting to your TV
- **Case 2 :** Connecting to a stereo amplifier with AV output jacks
- **Case 3 :** Connecting to an AV amplifier with a digital output jack

Manufactured under license from Dolby Laboratories. “Dolby” and the double-D symbol are trademarks of Dolby Laboratories.

“DTS” and “DTS Digital Out” are trademarks of Digital Theater Systems, Inc.

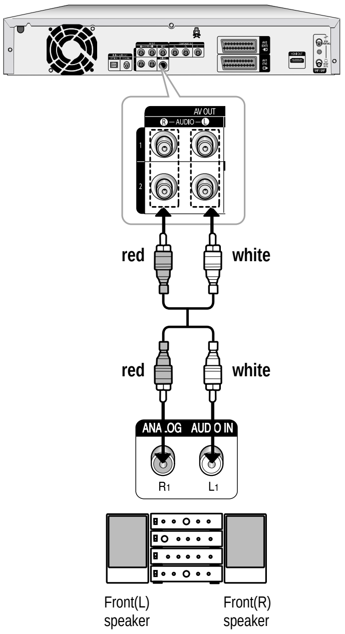
Case 1 : Connecting to your TV

If your TV has audio input jacks, use this connection.


AV OUT
R — AUDIO — L
INPUT
VIDEO
L
AUDIO
R
yellow
white
red
red
white
yellow
TV

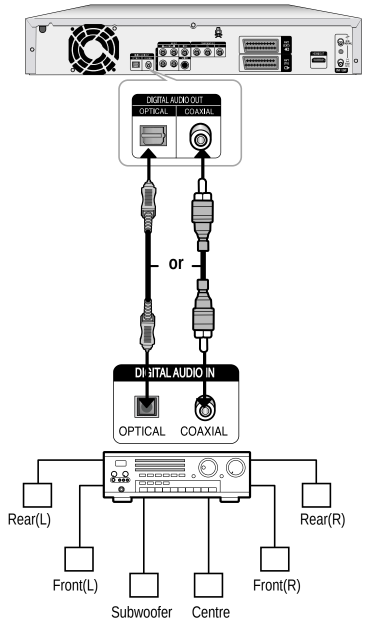
Case 2 : Connecting to a stereo amplifier with AV output jacks

If your stereo amplifier only has AUDIO INPUT jacks(L and R), use the AUDIO OUT jacks.


AV OUT
R — AUDIO — L
red
white
red
white
ANALOG AUDIO IN
R1
L1
Front(L) speaker
Front(R) speaker

Case 3: Connecting to an AV amplifier with a digital output jack

If your AV amplifier has a Dolby Digital, MPEG2 or DTS decoder and a digital input jack, use this connection. To enjoy Dolby Digital, MPEG2 or DTS sound, you will need to set up the audio settings. (See pages 38~39.)


DIGITAL AUDIO OUT
OPTICAL
COAXIAL
or
DIGITAL AUDIO IN
OPTICAL
COAXIAL
Rear(L)
Rear(R)
Front(L)
Subwoofer
Centre
Front(R)

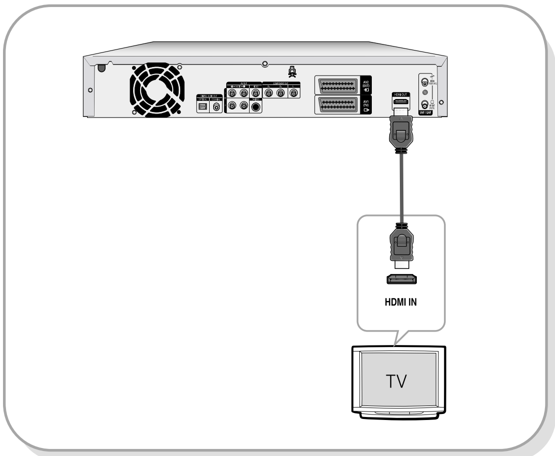
Connecting HDMI/DVI to a TV

If your TV has a HDMI/DVI input, connect HDMI/DVI Adapter cable to a TV. You will enjoy the best quality images and sounds.

- **Case 1 :** Connecting to a TV with HDMI Jack
- **Case 2 :** Connecting to a TV with DVI Jack

Case 1 : Connecting to a TV with HDMI Jack

- Using the HDMI cable connect the **HDMI OUT** jack on the rear of the HDD & DVD RECORDER to the **HDMI IN** jack of your TV.
- Press the input selector on your TV remote control until the HDMI signal from the HDD & DVD RECORDER appears on your TV screen.



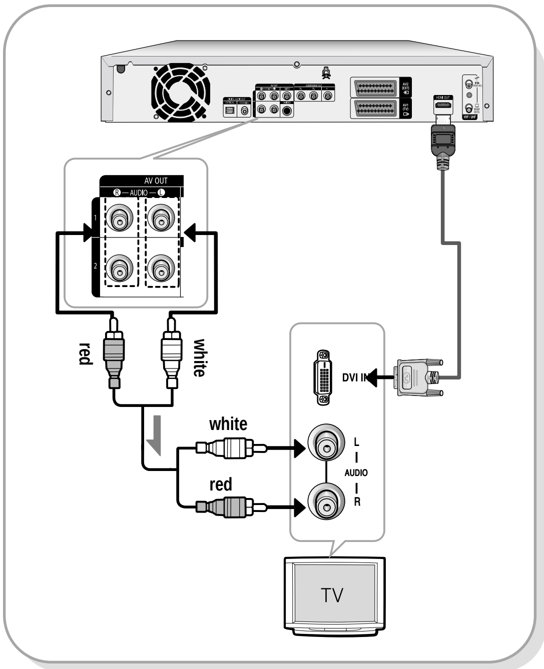
Case 2 : Connecting to a TV with DVI Jack

- Using the DVI Adapter Cable, connect the **HDMI OUT** jack on the rear of the HDD & DVD RECORDER to the **DVI IN** jack of your TV.
- Using the audio cables, connect the **AUDIO (red and white) OUT** jacks on the rear of the HDD & DVD RECORDER to the **AUDIO (red and white) IN** jacks of your TV. Turn on the HDD & DVD RECORDER and TV.
- Press the input selector on your TV remote control until the DVI signal from the HDD & DVD RECORDER appears on your TV screen.

CAUTION

- Make the HDMI cable connection before plugging in the power cord or after finishing the “Plug & Auto Setup.” Do not connect the HDMI cable while the “Plug & Auto Setup” is progressing.

- Progressive scan automatically activates when HDMI is connected.
- If your TV does not have Bitstream decoder, you must set the digital audio output to PCM in order to watch through the HDMI output. (See pages 38~39.)
- Depending on the HDMI device (TV/HDMI Receiver) you use, audio may not be supported. If TV/HDMI Receiver does not support Dolby digital, Audio output is not available when you set Digital output as 'Bitstream' in Audio setup menu. In this case, set the digital audio output to PCM. If TV/HDMI Receiver does not support DTS, Audio output is not available when you play disc in DTS format.
- Because HDMI is an evolving technology, it is possible that some devices with an HDMI input may not operate properly with this HDD & DVD RECORDER.
- You can switch from the HDMI output to other output only in stop mode.



NOTE

- **HDMI (High Definition Multimedia Interface)**
  HDMI is an interface to enable the digital transmission of video and audio data with just a single connector. Since HDMI is based on DVI, it is completely compatible with DVI. The only difference between HDMI and DVI is that HDMI supports multi-channel audio.
  Using HDMI, the HDD & DVD RECORDER transmits a digital video and audio signal and displays a vivid picture on a TV having an HDMI input jack.

- **HDMI connection description**
  HDMI connector - Both uncompressed video data and digital audio data (LPCM or Bit Stream data).
  - Though the HDD & DVD RECORDER uses a HDMI cable, the HDD & DVD RECORDER outputs only a pure digital signal to the TV.
  - If TV does not support HDCP (High-bandwidth Digital Content Protection), snow noise appears on the screen.
- **Why does Toshiba use HDMI?**
  Analog TVs require an analog video/audio signal. However, when playing a DVD, the data transmitted to a TV is digital. Therefore either a digital-to-analog converter (in the HDD & DVD RECORDER) or an analog-to-digital converter (in the TV) is required. During this conversion, the picture quality is degraded due to noise and signal loss. HDMI technology is superior because it requires no D/A conversion and is a pure digital signal from the HDD & DVD RECORDER to your TV.
- **What is the HDCP?**
  HDCP (High-bandwidth Digital Content Protection) is a system for protecting DVD content outputted via HDMI from being copied. It provides a secure digital link between a video source (PC, DVD. etc) and a display device (TV, projector. etc). Content is encrypted at the source device to prevent unauthorized copies from being made.

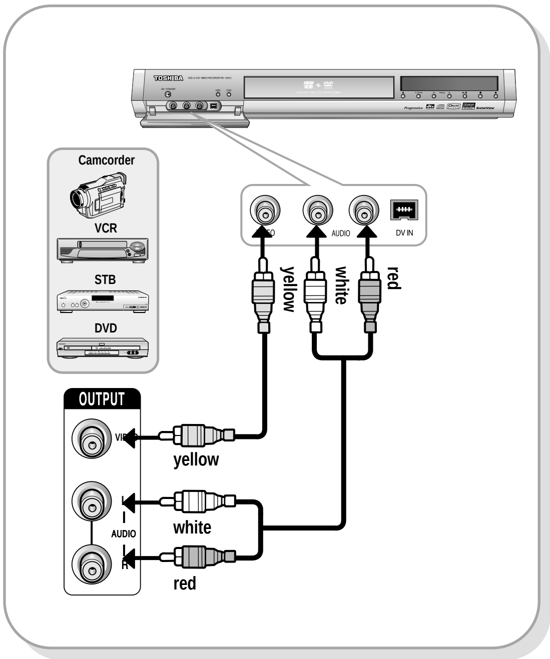
Connecting to AV 3 IN, DV input jack

This allows you to connect your HDD & DVD RECORDER to other external devices and view or record their outputs.

- **Case 1 :** Connecting a VCR, Set-Top Box(STB), DVD player or Camcorder to the AV3 IN jacks
- **Case2 :** Connecting a DV Device to the DV IN jack

Case 1 : Connecting a VCR, Set-Top Box(STB), DVD player or Camcorder to the AV3 IN jacks

Connecting a VCR or external device to AV3 IN jacks of the HDD & DVD RECORDER.
You can record from connected equipment (VCR, STB, DVD player or Camcorder).

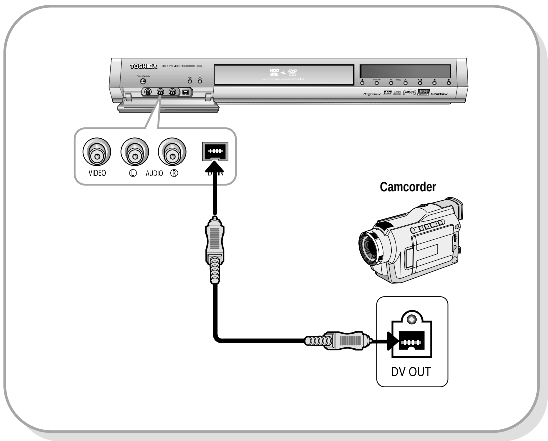


NOTE

- AV 3 in selection will be automatically done. If the input is not selected automatically, use **INPUT SEL.** button to select proper input.
- Copy protected content cannot be recorded.

Case 2 : Connecting a Camcorder to the DV IN jack

If your digital camcorder has a DV output jack, connect it to the DV input jack of your HDD & DVD RECORDER.



NOTE

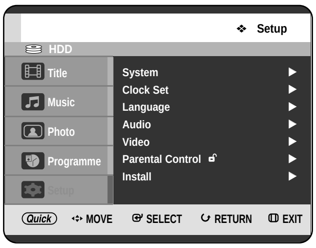
- If the input is not selected automatically, use **INPUT SEL.** button to select proper input.

System Setup

On-Screen Menu Navigation 25
Plug & Auto Setup 26
Setting the Clock 27
Presetting Channels with the Auto Setup function 28
Presetting Channels with the Manual Setup function 30
Setting up the Language Options 31
Auto Power Off Setting 32
CM Skip Time Setting 33
EP Mode Time Setting 34
Setting up the Front Display Options 35
Automatic Chapter Creator 36
Setting up NICAM Options 37
DivX(R) Registration 38
Setting up the Audio Options 38
Setting up the Video Display Options 40
Setting up Video Output Options 41
Setting up the Progressive scan 42
Canceling the Progressive scan 43
Setting up the Parental Control 44

On-Screen Menu Navigation

The on-screen menus allow you to enable or disable various functions on your HDD & DVD RECORDER. Use the following buttons to open and navigate through the on-screen menus.



1 **MENU Button**
Press this button on the remote control to open the on-screen menu.
Press again to exit the on-screen menu.

2 **▲▼ ◀ ▶ Buttons**
Press these buttons on remote control to move the selection bar ▲▼ ◀ ▶ to cycle through the menu options.

3 **OK Button**
Press this button on the remote control to confirm any new settings.

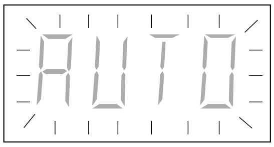
4 **RETURN Button**
Press this button on the remote control to return to the Previous menu screen displayed or to exit the on-screen menu.

Plug & Auto Setup

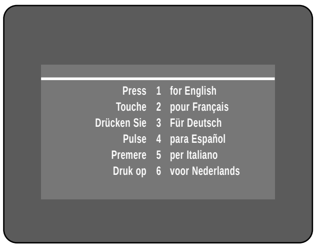
Your HDD & DVD RECORDER will automatically set itself up when it is plugged in for the first time. TV stations and clock will be stored in memory. The process takes a few minutes. Your HDD & DVD RECORDER will then be ready for use.

1 Connect the RF cable as indicated on page 19. (Connecting your HDD & DVD RECORDER to the TV, using the RF Cable and scart cable.)
Make the HDMI cable connection before plugging in the power cord or after finishing the “Plug & Auto Setup.” Do not connect the HDMI cable while the “Plug & Auto Setup” is progressing.

2 Plug the HDD & DVD RECORDER into the mains. “AUTO” in the front panel display flickers.

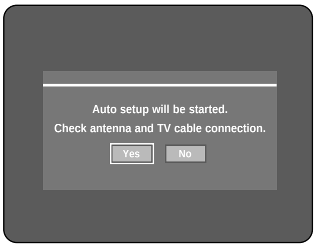


3 Press a number button to select the language.



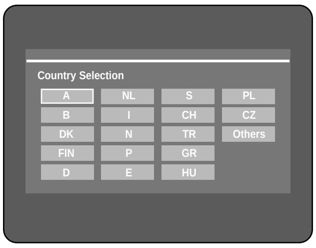
Press 1 for English
Touche 2 pour Français
Drücken Sie 3 Für Deutsch
Pulse 4 para Español
Premere 5 per Italiano
Druk op 6 voor Nederlands

4 Press the **OK** button to start the auto setup.



Auto setup will be started.
Check antenna and TV cable connection.

5 Select “Country” using the ▲▼ ◀ ▶ buttons to select your country.

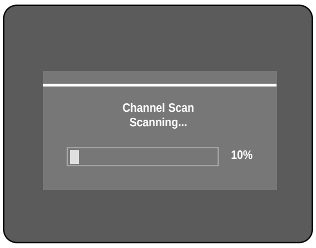


- Refer to following abbreviation table when selecting “Country”.

A(Austria)	NL(Netherlands)	S(Sweden)	PL(Poland)
B(Belgium)	I(Italy)	CH(Swiss)	CZ(Czech)
DK(Denmark)	N(Norway)	TR(Turkey)	Others
FIN(Finland)	P(Portugal)	GR(Greece)	
D(Deutschland)	E(Spain)	HU(Hungary)	

- The HDD & DVD RECORDER searches for the stations according to a preset preference list corresponding to the country that you have selected.

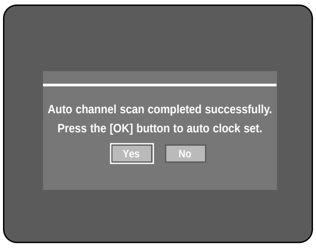
6 Auto channel scan will be started.



Channel Scan
Scanning...
10%

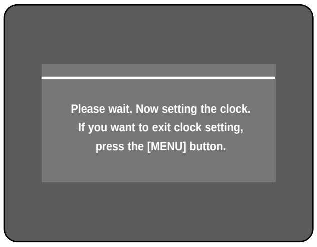
- The number of stations automatically stored by the HDD & DVD RECORDER depends on the number of stations that it has found.

7 After auto channel scan is completed, auto clock setting will be started automatically in 10 seconds. If you want to start auto clock setting immediately, press **OK** button. If you do not want to do auto clock setting, press **CANCEL** or **MENU** button.



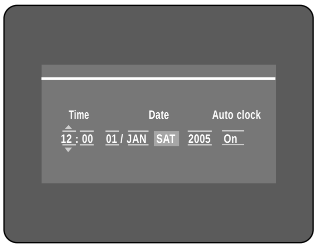
Auto channel scan completed successfully.
Press the [OK] button to auto clock set.

8 Wait until current date and time is displayed automatically. If you want to exit auto clock setting, press **MENU** button.



Please wait. Now setting the clock.
If you want to exit clock setting,
press the [MENU] button.

9 Check the date and time.



Time Date Auto clock
12 : 00 01 / JAN SAT 2005 On

- if it is : Correct, press **OK** button then the date and time will be saved. If you don't press the **OK** button, the date and time will be saved automatically after 5 seconds.
- if it is : Incorrect, input correct **Time**, **Date**, **Year** using ▲▼◀ ▶ buttons or number buttons. Press **OK** button then the date and time will be saved. When you need to change clock setting, you can set up it manually. (See page 27~28.)

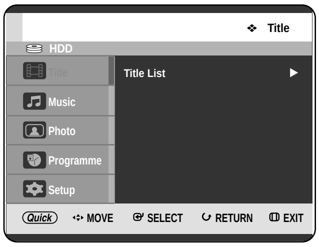
NOTE

- Now, HDD & DVD RECORDER is ready for use. Function for “Plug & Auto Setup” is fixed already. So if you want to change this fixed one, you can change it by Presetting the Stations in OSD “Presetting Channels with the Manual setup function” menu. (See page 30.)
- Auto setup function can be performed by pressing **STOP (⊙)** on the unit continuously for 5 seconds or more during power off with no disc inserted.

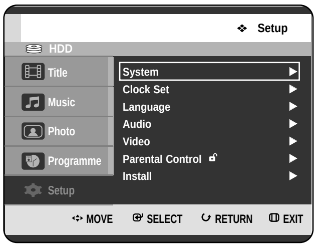
Setting the Clock

This menu is used to set the current time.
You need to set the time to use timer recording.

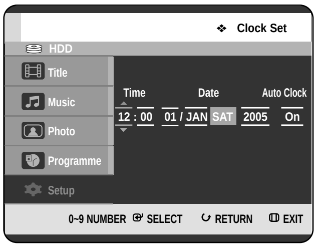
1 With the unit in Stop mode, press the **MENU** button.


Title
HDD
Title
Title List ▶
Music
Photo
Programme
Setup
Quick
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.


Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

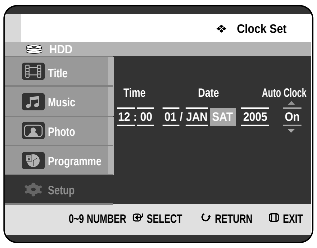
3 Press the ▲▼ buttons to select **Clock Set**, then press the **OK** or ▶ button.
Press the ▲▼◀ ▶ buttons to input Time, Date or Year. Press the number buttons to input clock data directly.
The day of the week is displayed automatically.



Time Date Auto Clock
12 : 00 01 / JAN SAT 2005 On

Clock Set
HDD
Title
Music
Photo
Programme
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **On** for the Auto Clock.


Clock Set
HDD
Title
Music
Photo
Programme
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Time: 12 : 00
Date: 01 / JAN SAT 2005
Auto Clock: On

5 Press the **OK** button, then the date and time will be saved. If you don't press the **OK** button, it will not be saved.

NOTE

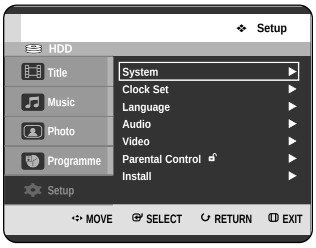
- You must have the RF cable connected to set the Auto Clock. (See page 19.)
- The HDD & DVD RECORDER automatically sets the clock according to the time signal broadcast between the channels PR1 to PR5. If you do not need the auto clock set function, select Off.

Presetting Channels with the Auto Setup function

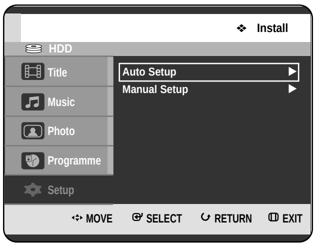
This feature allows you to manually set the HDD & DVD RECORDER tuner band to Antenna or Cable, whichever you connected to the Antenna In jack during initial setup.

1 With the unit in Stop mode, press the **MENU** button.

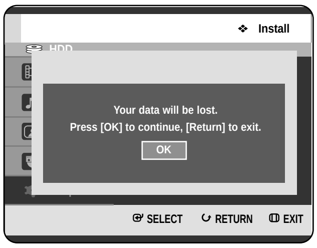
2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.


Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Install**, then press the **OK** or ▶ button.

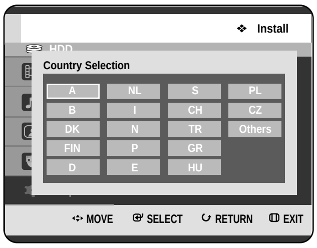

Install
HDD
Title
Music
Photo
Programme
Setup
Auto Setup ▶
Manual Setup ▶
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **Auto Setup**, then press the **OK** or ▶ button.
The message “Your data will be lost. Press [OK] to continue, [Return] to exit.” is displayed.


Install
HDD
OK
SELECT
RETURN
EXIT

Your data will be lost.
Press [OK] to continue, [Return] to exit.

5 Press the **OK** button, then press the ▲▼◀ ▶ buttons to select your Country.
- The HDD & DVD RECORDER searches for the stations according to a preset preference list corresponding to the country that you have selected.


Install
HDD
MOVE
SELECT
RETURN
EXIT

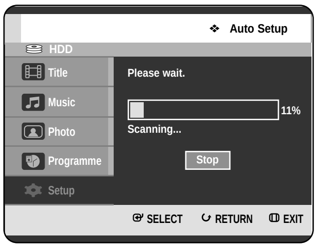
Country Selection

A	NL	S	PL
B	I	CH	CZ
DK	N	TR	Others
FIN	P	GR	
D	E	HU	

Refer to following table when selecting your country.

A(Austria)	NL(Netherlands)	S(Sweden)	PL(Poland)
B(Belgium)	I(Italy)	CH(Swiss)	CZ(Czech)
DK(Denmark)	N(Norway)	TR(Turkey)	Others
FIN(Finland)	P(Portugal)	GR(Greece)	
D(Deutschland)	E(Spain)	HU(Hungary)	

6 Press the **OK** button. If you want to exit, press the **MENU** button.


Auto Setup
HDD
Title
Music
Photo
Programme
Setup
11%
Stop
SELECT
RETURN
EXIT

Please wait.
Scanning...

- The first frequency band is scanned and the first station found is displayed and stored. And the HDD & DVD RECORDER searches for the second station and so on.
- When the automatic scanning procedure has finished, the HDD & DVD RECORDER switches automatically to programme 1.
- The number of stations automatically stored by the HDD & DVD RECORDER depends on the number of stations that it has found.

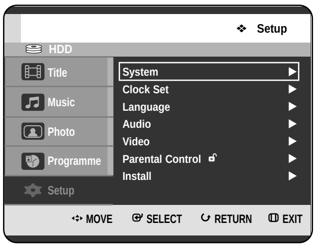
7 Press the **OK** button to stop the Auto Setup.

Presetting Channels with the Manual Setup function

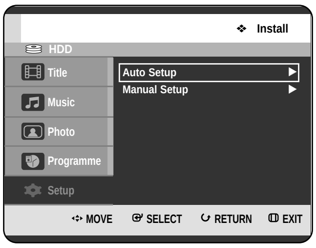
You can add preset channel that Auto Channel Search missed. And you can delete a channel you wish to remove. You can programme the order of channels.

1 With the unit in Stop mode, press the **MENU** button.

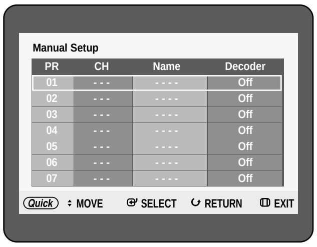
2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.


Setup
HDD
Title
Music
Photo
Programme
Setup
System
Clock Set
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Install**, then press the **OK** or ▶ button.


Install
HDD
Title
Music
Photo
Programme
Setup
Auto Setup
Manual Setup
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **Manual Setup**, then press the **OK** or ▶ button.

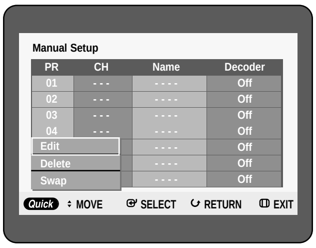


Manual Setup

PR	CH	Name	Decoder
01	- - -	- - - -	Off
02	- - -	- - - -	Off
03	- - -	- - - -	Off
04	- - -	- - - -	Off
05	- - -	- - - -	Off
06	- - -	- - - -	Off
07	- - -	- - - -	Off

Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select a **PR**(programme) you wish to edit, delete, or swap, then press the **QUICK** button.
Select **Edit**, **Delete** or **Swap**.

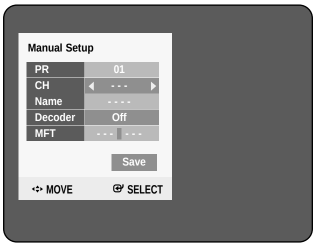


Manual Setup

PR	CH	Name	Decoder
01	- - -	- - - -	Off
02	- - -	- - - -	Off
03	- - -	- - - -	Off
04	- - -	- - - -	Off
		- - - -	Off
		- - - -	Off
		- - - -	Off

Edit
Delete
Swap
Quick
MOVE
SELECT
RETURN
EXIT

- **In case of Edit :** You can add or edit PR(programme) information. After change PR informations (**CH**, **Name**, **Decoder**, **MFT**), select **Save**, then press the **OK** button.



Manual Setup

PR	01
CH	◀ - - - ▶
Name	- - - -
Decoder	Off
MFT	- - - ▮ - - -

Save
MOVE
SELECT

- **CH** : Tune the channel using ◀ ▶ buttons.
- **Name** : Display station name automatically detected in broadcasting signal. If not detected, you can edit name by using ▲▼◀ ▶ buttons.
- **Decoder** : If you set on, you can record scrambled channels using external decoder box. Before setting on, refer to connecting external decoder box in the page 20.
- **MFT(Manual Frequency Tunning)** : You can tune up the channel frequency better using ◀ ▶ buttons.

- **In case of Delete :** the channel information of selected PR(programme) will be removed.

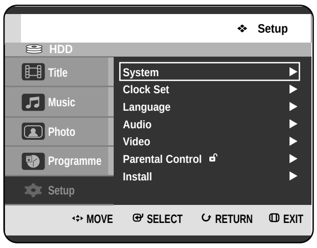
- **In case of Swap :** You can swap the channel information of two PR(programme). For example, if you wish to swap PR2 and PR5, select swap at PR2, then press the **OK** button at PR5.

Setting up the Language Options

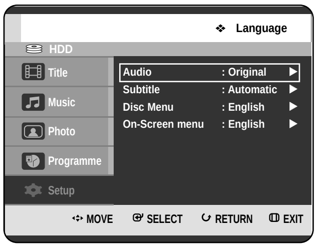
If you set the audio, subtitle, disc menu and on-screen menu in advance, they will come up automatically every time you watch a movie.
If the selected language is not recorded on the disc, the original pre-recorded language is selected.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

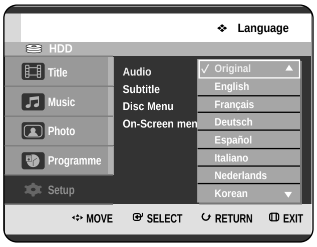

Setup
HDD
Title
Music
Photo
Programme
Setup
System
Clock Set
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Language**, then press the **OK** or ▶ button.
Language setup menu will be displayed.


Language
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Audio : Original
Subtitle : Automatic
Disc Menu : English
On-Screen menu : English

4 Press the ▲▼ buttons to select the desired language option, press the **OK** or ▶ button.


Language
HDD
Title
Music
Photo
Programme
Setup
Audio
Subtitle
Disc Menu
On-Screen men
✓ Original
English
Français
Deutsch
Español
Italiano
Nederlands
Korean
MOVE
SELECT
RETURN
EXIT

- **Audio** : For the disc audio language.
- **Subtitle** : For the disc subtitles.
- **Disc Menu**: For the disc menu contained on the disc.
- **On-Screen menu**: For the on-screen menu of your HDD & DVD RECORDER.

5 Press the ▲▼ buttons to select the desired language, then press the **OK** or ▶ button.

NOTE

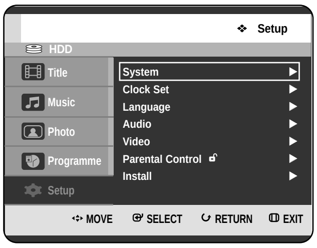
- Press the **RETURN** or ◀ button to return to the previous menu. Press the **MENU** button to exit the menu.
- The selected language will only appear if it is supported on the disc.

Auto Power Off Setting

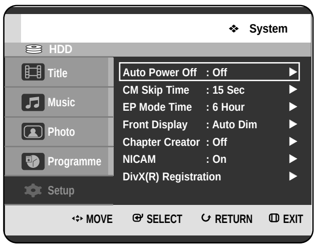
This feature automatically turns off your HDD & DVD RECORDER, if you do not press any button for the selected time.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

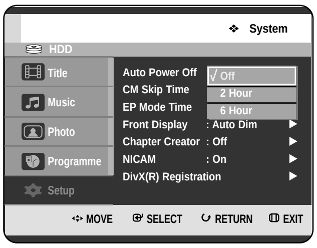

Setup
HDD
Title
Music
Photo
Programme
Setup
System
Clock Set
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **OK** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off
NICAM : On
DivX(R) Registration

4 Press the ▲▼ buttons to select **Auto Power Off**, then press the **OK** or ▶ button.


System
HDD
Title
Music
Photo
Programme
Setup
√ Off
2 Hour
6 Hour
MOVE
SELECT
RETURN
EXIT

Auto Power Off
CM Skip Time
EP Mode Time
Front Display : Auto Dim
Chapter Creator : Off
NICAM : On
DivX(R) Registration

5 Press the ▲▼ buttons to select the desired item, then press the **OK** or ▶ button.

- **Off** : Auto power off is disabled.
- **2 Hour** : DVD-HDD Receiver will automatically turns off for 2 hours after the last button is pressed.
- **6 Hour** : DVD-HDD Receiver will automatically turns off for 6 hours after the last button is pressed.

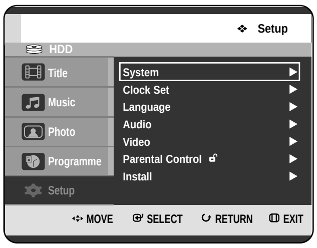
- If turn off time set by Auto Power Off function is reached during a playback or recording, the device will operate until the playback or recording is over.

CM Skip Time Setting

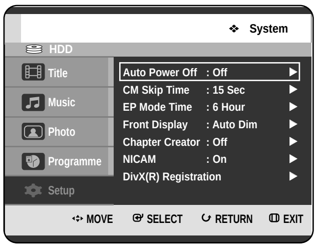
When a programme recorded on a HDD, a DVD-RAM, a DVD-RW, or a DVD-R is played, the unit can be set to automatically skip a portion of the programme corresponding to a CM(commercial) skip time set by the user.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

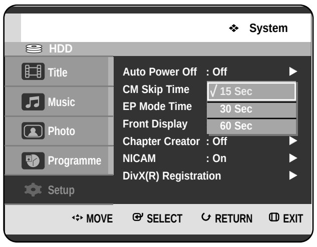

Setup
HDD
Title
Music
Photo
Programme
Setup
System
Clock Set
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **OK** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off
NICAM : On
DivX(R) Registration

4 Press the ▲▼ buttons to select **CM Skip Time**, then press the **OK** or ▶ button.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time √ 15 Sec
EP Mode Time 30 Sec
Front Display 60 Sec
Chapter Creator : Off
NICAM : On
DivX(R) Registration

5 Press the ▲▼ buttons to select the desired time interval, then press the **OK** or ▶ button.

6 If you press the **CM SKIP** button during playback, the section corresponding to the set time is skipped, and then the next section is played.

NOTE

- CM Skip can be performed only during normal playback.
- When the time set is more than a remaining time of a current title: The next title is played from the beginning.
- When the time set is more than a remaining time of a playlist : The next scene is played.
- CM Skip does not work in a still picture mode.
- When a set time is less than a remaining time of a scene, a last title, or a last track that is displayed currently, a prohibition mark appears.
- CM Skip releases Repeat (including Repeat A-B, Chapter, and Title).
- CM Skip may not operate with some DVD-Video discs.
- CM Skip does not work on MPEG4 disc.

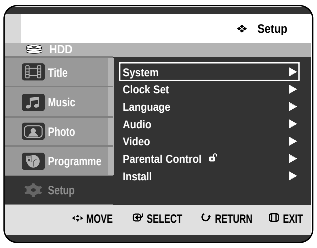
EP Mode Time Setting

You can select one of four recording modes by pressing the **REC MODE** button repeatedly.
EP mode is one of four REC Mode (XP, SP, LP, EP).
In EP(Extended Play) mode, you can set recording time to 6 or 8 hours by this setting.

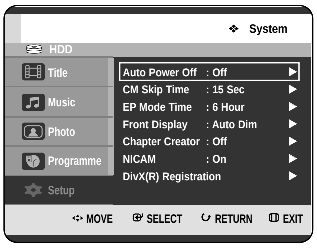
- This setting will affect the capacity of HDD recording (205 hours / 272 hours).

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

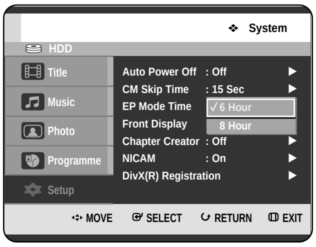

Setup
HDD
Title
Music
Photo
Programme
Setup
System
Clock Set
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **OK** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off
NICAM : On
DivX(R) Registration

4 Press the ▲▼ buttons to select **EP Mode Time**, then press the **OK** or ▶ button.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time √ 6 Hour
8 Hour
Front Display
Chapter Creator : Off
NICAM : On
DivX(R) Registration

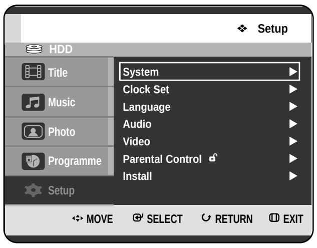
5 Press the ▲▼ buttons to select the desired Time, then press the **OK** or ▶ button.

Setting up the Front Display Options

Adjust the brightness of the unit's front panel display.

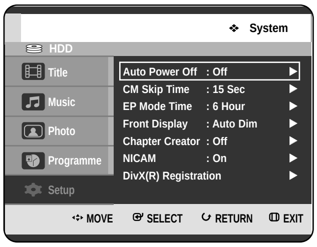
1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.


Setup
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

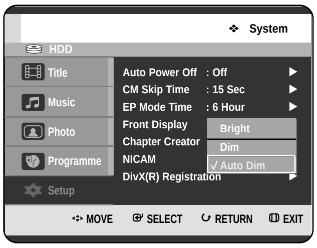
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶

3 Press the ▲▼ buttons to select **System**, then press the **OK** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off ▶
CM Skip Time : 15 Sec ▶
EP Mode Time : 6 Hour ▶
Front Display : Auto Dim ▶
Chapter Creator : Off ▶
NICAM : On ▶
DivX(R) Registration ▶

4 Press the ▲▼ buttons to select **Front Display**, then press the **OK** or ▶ button.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off ▶
CM Skip Time : 15 Sec ▶
EP Mode Time : 6 Hour ▶
Front Display
Chapter Creator
NICAM
DivX(R) Registration ▶
Bright
Dim
√ Auto Dim

5 Press the ▲▼ buttons to select the desired item, then press the **OK** or ▶ button.

- **Bright** : Makes the Front Panel Display bright.
- **Dim** : Makes the Front Panel Display dim.
- **Auto Dim** : Makes the Front Panel Display dim automatically when the set is in standby mode.

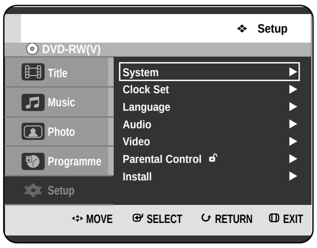
Automatic Chapter Creator

DVD-RW DVD-R

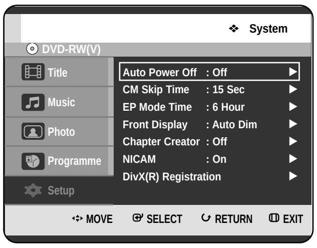
(V mode)

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

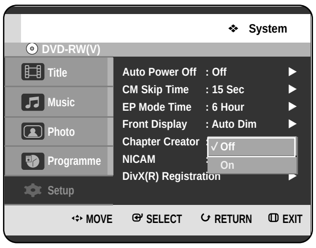

Setup
DVD-RW(V)
Title
Music
Photo
Programme
Setup
System
Clock Set
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **OK** or ▶ button.
System menu will be displayed.


System
DVD-RW(V)
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off
NICAM : On
DivX(R) Registration

4 Press the ▲▼ buttons to select **Chapter Creator**, then press the **OK** or ▶ button.


System
DVD-RW(V)
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

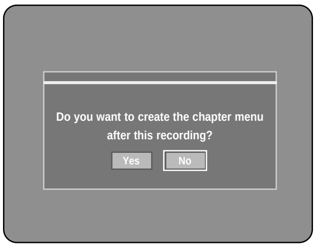
Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : √ Off / On
NICAM
DivX(R) Registration

5 Press the ▲▼ buttons to select the desired item, then press the **OK** or ▶ button.

- **Off:** Select this option when you do not want Automatic Chapter Creator.
- **On:** Select this option when you want Automatic Chapter Creator.

Press the **MENU** button to exit the menu.

6 Press the **REC** button to start recording (See page 79 about how to set recording speed).
The message “Do you want to create the chapter menu after this recording?” is displayed.

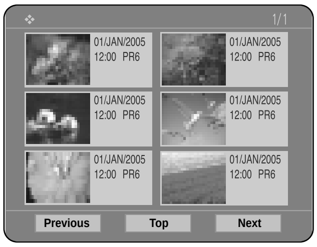

Do you want to create the chapter menu after this recording?

7 Press the ◀ ▶ buttons to select **Yes** and press the **OK** button.

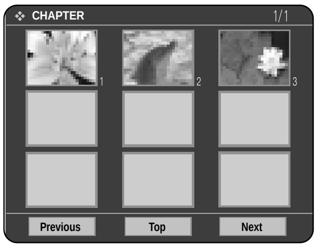
- A new chapter is created according to the selected recording mode. A chapter will be about 5 minutes long in XP and SP, and about 15 minutes long in LP and EP mode.

8 Press the **STOP (⊡)** button to stop recording.

9 To display the created titles, finalise the disc (See page 126) and then press the **TOP MENU** button. The title menu will be displayed.


1/1
01/JAN/2005 12:00 PR6
01/JAN/2005 12:00 PR6
01/JAN/2005 12:00 PR6
01/JAN/2005 12:00 PR6
01/JAN/2005 12:00 PR6
01/JAN/2005 12:00 PR6
Previous
Top
Next

10 To display the created chapters, select the desired Title and then press the **DISC MENU** button. The chapter menu for the selected Title will be displayed.


CHAPTER
1/1
1
2
3
Previous
Top
Next

Caution

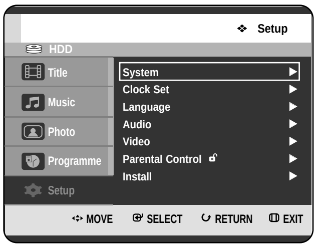
- The Automatic Chapter Creator only works on DVD-RW and DVD-R discs recorded in Video mode. It Will not function in VR mode.
- The Automatic Chapter Creator function does not work during Timer Recording or in standby mode.

Setting up NICAM Options

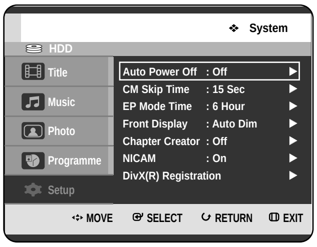
NICAM programmes are divided into 3 types. NICAM Stereo, NICAM Mono and Bilingual (transmission in another language). NICAM programmes are always accompanied by a standard mono sound broadcast. You can select the desired sound by setting NICAM On or Off.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

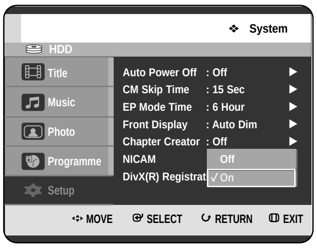

Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **OK** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off ▶
CM Skip Time : 15 Sec ▶
EP Mode Time : 6 Hour ▶
Front Display : Auto Dim ▶
Chapter Creator : Off ▶
NICAM : On ▶
DivX(R) Registration ▶

4 Press the ▲▼ buttons to select **NICAM**, then press the **OK** or ▶ button.


System
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off ▶
CM Skip Time : 15 Sec ▶
EP Mode Time : 6 Hour ▶
Front Display : Auto Dim ▶
Chapter Creator : Off ▶
NICAM
DivX(R) Registrat

Off
√ On

5 Press the ▲▼ buttons to select **Off** or **On**, then press the **OK** or ▶ button.

- **Off**: Only set at this position to record the standard mono sound during a NICAM broadcast if the stereo sound is distorted due to inferior reception conditions.
- **On**: NICAM mode

DivX(R) Registration

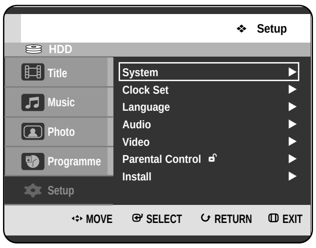
Please use the Registration code to register this HDD & DVD RECORDER with the DivX(R) Video On Demand format. For more information, visit **www.divx.com/vod**

Setting up the Audio Options

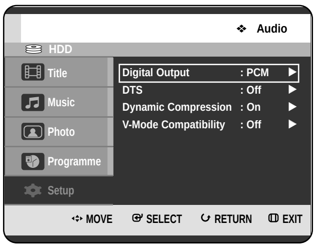
You can connect the HDD & DVD RECORDER to an external amplifier or Home theatre.
Allow you to setup the Audio device and sound status depending on the audio system in use.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.


Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Audio**, then press the **OK** or ▶ button.
Audio setup menu will be displayed.


Audio
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Digital Output : PCM ▶
DTS : Off ▶
Dynamic Compression : On ▶
V-Mode Compatibility : Off ▶

4 Press the ▲▼ buttons to select the desired audio option, then press the **OK** or ▶ button.

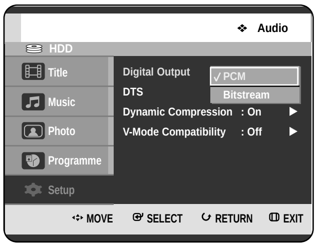
5 Press the ▲▼ buttons to select the desired item, then press the **OK** or ▶ button.

NOTE

- Press the **RETURN** or ◀ button to return to the previous menu.
Press the **MENU** button to exit the menu.

Digital Output

1. PCM : Select this when you have no equipment that can decode Dolby Digital (or MPEG-2) signal. When you play Dolby Digital (or MPEG-2) sound track, the digital output are converted to PCM Stereo.
2. Bitstream : Output Dolby Digital (or MPEG-2) audio as bitstream. Select this when your AV receiver or AV amplifier have Dolby Digital (or MPEG-2) Decoder.


Audio
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

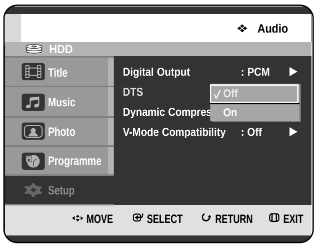
Digital Output ✓ PCM / Bitstream
DTS
Dynamic Compression : On ▶
V-Mode Compatibility : Off ▶

NOTE

- Digital output setting is equally applied to both Dolby Digital and MPEG-2 audio. LPCM sound track is always outputted as PCM. It has no relation with Digital Output setting.
- Be sure to select the correct Digital Output or you will hear no sound or loud noise.

DTS

1. Off : Doesn’t output DTS signal. Select this when your AV receiver or AV amplifier does not have DTS decoder.
2. On : Outputs DTS Bitstream via digital output when you play DTS track. Select this only when your AV receiver (or AV amplifier) have DTS decoder.


Audio
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Digital Output : PCM ▶
DTS ✓ Off / On
Dynamic Compres
V-Mode Compatibility : Off ▶

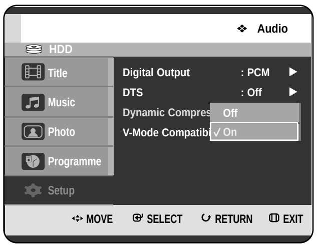
NOTE

- When DTS soundtrack is played, sound does not output from AV Audio Output.

Dynamic Compression

This is only active when a Dolby Digital signal is detected.

1. On : When Movie soundtracks are played at low volume or from smaller speakers, the system can apply appropriate compression to make low-level content more intelligible and prevent dramatic passages from getting too loud.
2. Off : You can enjoy the movie with the standard Dynamic Range.

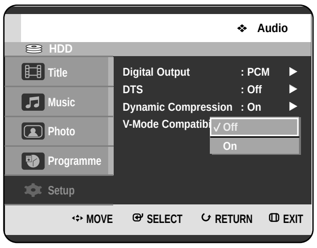

Audio
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Digital Output : PCM ▶
DTS : Off ▶
Dynamic Compres Off / ✓ On
V-Mode Compatib

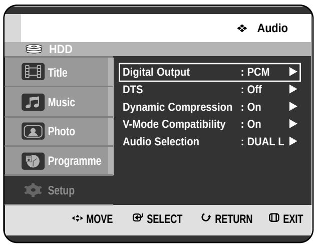
V-Mode Compatibility

This feature is about the setup for selecting audios when recording the NICAM STEREO (Multi-audio) broadcasting on HDD. It does not affect to the direct DVD recording of a programme.

1. Off : Both “DUAL L” and “DUAL R” of the multi-audio broadcasting are recorded on HDD.Titles recorded on HDD under such setup status cannot be copied to V mode (DVD-RW/-R).
2. On : Either “DUAL L” or “DUAL R” of the multi-audio broadcasting is recorded on HDD.Titles recorded on HDD under such setup status can be copied to DVD-R or DVD-RW (V mode). “DUAL L” and “DUAL R” options can be selected from “Audio Selection.”


Audio
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Digital Output : PCM ▶
DTS : Off ▶
Dynamic Compression : On ▶
V-Mode Compatib ✓ Off / On


Audio
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

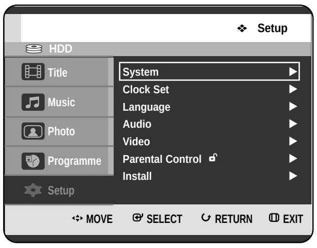
Digital Output : PCM ▶
DTS : Off ▶
Dynamic Compression : On ▶
V-Mode Compatibility : On ▶
Audio Selection : DUAL L ▶

Setting up the Video Display Options

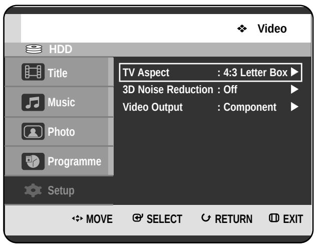
This function allows you to setup the TV screen settings. This function depends on disc type. It may not work for some disc types.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

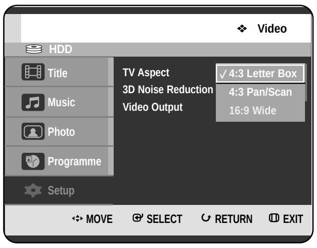

Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Video**, then press the **OK** or ▶ button.
Video setup menu will be displayed.


Video
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

TV Aspect : 4:3 Letter Box ▶
3D Noise Reduction : Off ▶
Video Output : Component ▶

4 Press the ▲▼ buttons to select the desired video option, then press the **OK** or ▶ button.


Video
HDD
Title
Music
Photo
Programme
Setup
TV Aspect
3D Noise Reduction
Video Output
√ 4:3 Letter Box
4:3 Pan/Scan
16:9 Wide
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select the desired item, then press the **OK** or ▶ button.

NOTE

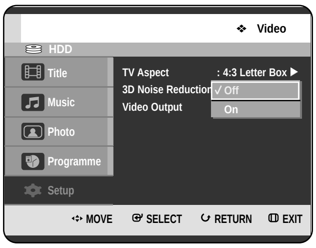
- Press the **RETURN** or ◀ button to return to the previous menu.
  Press the **MENU** button to exit the menu.

TV Aspect

Depending on the type of television you have, you may want to adjust the screen setting (aspect ratio).

1. 4:3 Letter Box : Select when you want to see the total 16:9 ratio screen DVD supplies, even though you have a TV with a 4:3 ratio screen. Black bars will appear at the top and bottom of the screen.
2. 4:3 Pan/Scan : Select this for conventional size TV when you want to see the central portion of the 16:9 screen. (Extreme left and right side of movie picture will be cut off.)
3. 16:9 Wide : You can view the full 16:9 picture on your widescreen TV.

3D Noise Reduction (motion adaptive noise reduction)


Video
HDD
Title
Music
Photo
Programme
Setup
TV Aspect : 4:3 Letter Box ▶
3D Noise Reduction
Video Output
√ Off
On
MOVE
SELECT
RETURN
EXIT

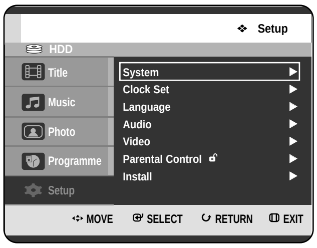
1. Off : Normal
2. On : Provides a cleaner picture through noise reduction.

Setting up Video Output Options

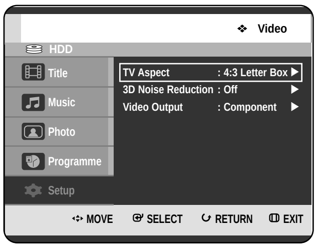
You can enjoy high quality image through RGB or Component video connections. RGB video output is available connecting scart jack(AV1) and component video output is available connecting component(Y,PB,PR) jack. Only one of these signals can be selected at one time.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

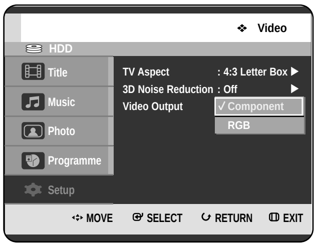

Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Video**, then press the **OK** or ▶ button.
Video setup menu will be displayed.


Video
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

TV Aspect : 4:3 Letter Box ▶
3D Noise Reduction : Off ▶
Video Output : Component ▶

4 Press the ▲▼ buttons to select **Video Output**, then press the **OK** or ▶ button.


Video
HDD
Title
Music
Photo
Programme
Setup
√ Component
RGB
MOVE
SELECT
RETURN
EXIT

TV Aspect : 4:3 Letter Box ▶
3D Noise Reduction : Off ▶
Video Output

5 Press the ▲▼ buttons to select the desired item, then press the **OK** or ▶ button.

In Component mode, you can set video output to Progressive (P.SCAN) or Interlace, see pages 42~43.

If the HDMI cable is not connected, available video output jacks are as follow.

Available Video Output Jack

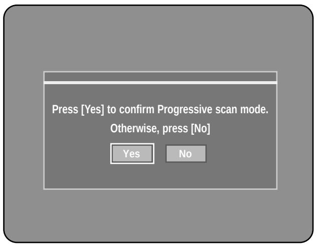
Setting mode / Output jack		Component mode		RGB Mode
		P.SCAN off mode (Interlace mode)	P.SCAN on mode	
Component Output (Y, Pb, Pr)		O	O (TV in progressive mode)	X
AV1 Scart	R, G, B	X	X	O
	Composite	O	X	X
AV2 Scart	Composite	O	X	O
Composite Video out		O	X	O
S-Video out		O	X	O

NOTE
- When the HDMI cable is connected, other Video output does not operate.

Setting up the Progressive scan

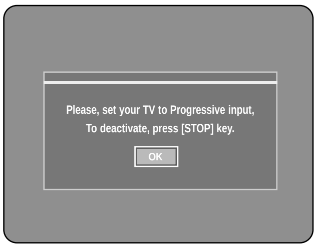
If the TV supports Progressive Scan, press the **P.SCAN** button on the front of the HDD & DVD RECORDER to enjoy.
If you select “Progressive scan mode”, the component cable has to be connected. (See page 21.)

1 With the unit in Stop mode, press the **P.SCAN** button on the front of the HDD & DVD RECORDER.
The message “Press [Yes] to confirm Progressive scan mode. Otherwise, press [No]” will appear.
Press the ◄ ► buttons to select **Yes**, and then press the **OK** button.



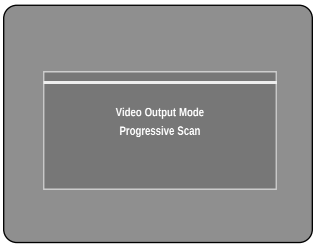
Press [Yes] to confirm Progressive scan mode.
Otherwise, press [No]

2 The message “Please, set your TV to Progressive input. To deactivate, press [STOP] key.” will appear. Press the **OK** button.



Please, set your TV to Progressive input,
To deactivate, press [STOP] key.

3 The message “Video Output Mode Progressive Scan” will appear.



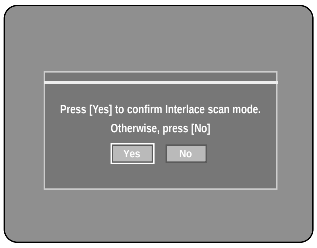
Video Output Mode
Progressive Scan

NOTE

- This function is not available when HDMI is connected.
- If the **P.SCAN** button on the HDD & DVD RECORDER’s front panel is pressed during playback, the message “This function is possible only on stop mode” appears on the screen.
- Progressive setting is only available when the HDD & DVD RECORDER is in stop mode.

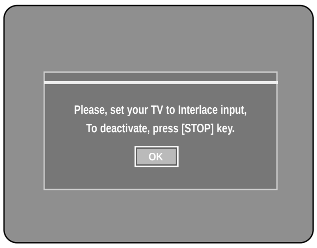
Canceling the Progressive scan

1 With the unit in Stop mode, press the **P.SCAN** button on the front of the HDD & DVD RECORDER. The message “Press [Yes] to confirm Interlace scan mode. Otherwise, press [No]” will appear. Press the ◄ ► buttons to select **Yes**, and then press the **OK** button.



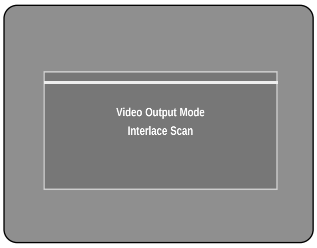
Press [Yes] to confirm Interlace scan mode.
Otherwise, press [No]

2 The message “Please, set your TV to Interlace input. To deactivate, press [STOP] key.” will appear. Press the **OK** button.



Please, set your TV to Interlace input,
To deactivate, press [STOP] key.

3 The message “Video Output Mode Interlace Scan” will appear.



Video Output Mode
Interlace Scan

NOTE

- Do not press the **P.SCAN** button if you are using a TV that does not support Progressive mode. Nothing will be displayed on the screen if pressed.
- If you press the **P.SCAN** button by mistake when your TV does not support Progressive mode, you need to release the Progressive mode. To release the Progressive mode, press the **P.SCAN** button on the front panel 3 times. The screen will recover after the PS ○ indicator on the front panel display turns off.

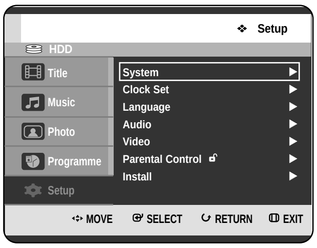
Setting up the Parental Control

The Parental Control function works in conjunction with DVDs that have been assigned a rating which helps you control the types of DVDs that your family watches. There are up to 8 rating levels on a disc.

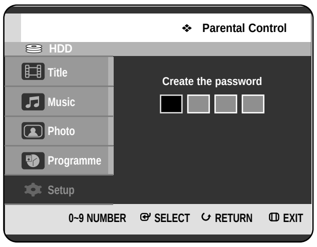
DVD-VIDEO

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **OK** or ▶ button.

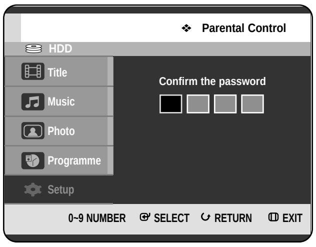

Setup
HDD
Title
Music
Photo
Programme
Setup
System ▶
Clock Set ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
Install ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Parental Control**, then press the **OK** or ▶ button.


Parental Control
HDD
Title
Music
Photo
Programme
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

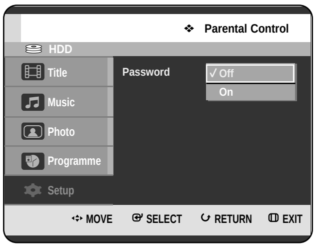
Create the password

4 Enter the 4-digit password using the number buttons on the remote control.
The “Confirm the password” message will be displayed. Enter your password again.


Parental Control
HDD
Title
Music
Photo
Programme
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Confirm the password

5 Press the **OK** or ▶ button to select Password.


Parental Control
HDD
Title
Music
Photo
Programme
Setup
MOVE
SELECT
RETURN
EXIT

Password ✓ Off
On

6 Press the ▲▼ buttons to select **On** or **Off**, then press the **OK** or ▶ button.

NOTE

- Press the **RETURN** or ◀ button to return to the previous menu.
  Press the **MENU** button to exit the menu.

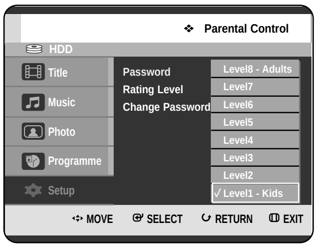
If you forgot your password

1 Remove the disc.

2 Press and hold the **STOP (■)** button and **PLAY (▶II)** button on the front panel for 5 seconds or more. All settings including the password will revert to the factory settings. Do not use this unless absolutely necessary. (Note that this function is possible only when no disc is inserted.)

About the Rating Level

1 Press the ▲▼ buttons to select **Rating Level**, then press the **OK** or ▶ button.



❖ Parental Control
HDD
Title
Music
Photo
Programme
Setup
Password
Rating Level
Change Password
Level8 - Adults
Level7
Level6
Level5
Level4
Level3
Level2
√ Level1 - Kids
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select the rating level you want, then press the **OK** or ▶ button.

3 When you operate your HDD & DVD RECORDER for the first time, the “Create the Password” message will be displayed.
For example, if you select up to Level 6, discs that contain Level 7 and 8 will not play. A larger number indicates that the programme is intended for adult use only.

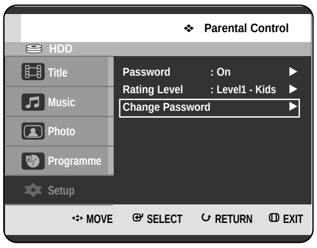
4 Press the **OPEN/CLOSE** button to activate the Rating Level setting.
If the DVD disc has been designed to temporarily cancel the Rating Level, the screen which follows the “▶ Play” screen will change depending on which disc is played.
If you select “YES” with the **OK** button, “Enter the Password” screen will appear.
Input the 4-digit password as you have set and playback will start.
If “NO” is selected, press the OPEN/CLOSE to remove the disc.

NOTE

- **Rating**
  - **Rating 1,2** : For every age (a disc free of obsceneness, violence, drug, or insult)
  - **Rating 3** : Under parents' instruction or recommendation, Improper for young kids (a disc containing violence but free of plain obsceneness or drug)
  - **Rating 4,5** : In the attendance of parents under the age of 13 (a disc free of sexual act or excessive violence)
  - **Rating 6** : In the attendance of parents under the age of 17 (a disc for adult containing insult, violence, sexual act, and drug)
  - **Rating 7,8** : Over the age of 17 only(a disc for adult only containing playing sexual act and excessive violence)

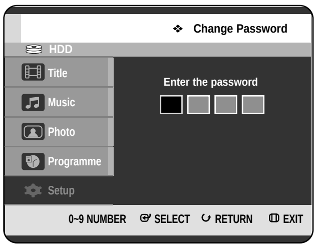
About the Change Password

1 Press the ▲▼ buttons to select **Change Password**, then press the **OK** or ▶ button.



❖ Parental Control
HDD
Title
Music
Photo
Programme
Setup
Change Password
MOVE
SELECT
RETURN
EXIT

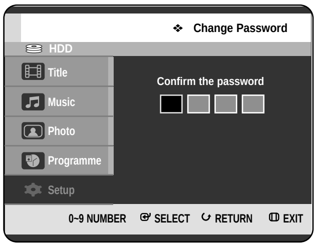
Password : On
Rating Level : Level1 - Kids



❖ Change Password
HDD
Title
Music
Photo
Programme
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Enter the password

2 Enter the 4-digit password using the number buttons on the remote control.
The “Confirm the password” message will be displayed.



❖ Change Password
HDD
Title
Music
Photo
Programme
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Confirm the password

3 Enter your password again using the number buttons on the remote control.

NOTE

- See page 44 if you forgot your password.

Playback

This section introduces basic functions of playback and playback by disc type.

DOLBY DIGITAL	dts	DIGITAL SOUND
Dolby Digital	DTS	Digital Audio
STEREO	PAL	MP3 DIGITAL DISC PLAYBACK
Stereo	PAL broadcast system in U.K, France, Germany, etc.	MP3
DivX VIDEO		
DivX		

Before Playing 46
Playing a Disc 47
Using the Disc Menu & Top Menu 48
Using the Search & Skip Functions 48
Slow Motion Play/Step Motion Play 49
About QUICK 50
Playing the Title List 52
Navigation Menu 53
Using the Markers 56
Using the Bookmarks 58
Selecting the Subtitle Language 60
Selecting the Soundtracks & Audio Channels 61
Changing the Camera Angle 62
Repeat Play 62
Zooming-In 64
Select Media 64
Playing an Audio CD/MP3 65
Playing a Picture 71
Playing an MPEG4 74

Before Playing

Read the following information before playing a disc.

Region code (DVD-Video only)

Both the HDD & DVD RECORDER and the discs are coded by region. These regional codes must match in order for the disc to play. If the codes do not match, the disc will not play. The Region Number for this HDD & DVD RECORDER is described on the rear panel of the HDD & DVD RECORDER.

Disc types that can be played

Disc Types	Disc Logo	Recorded content	Disc Shape	Max. Playing Time
DVD-VIDEO	DVD VIDEO	AUDIO + VIDEO	Single sided(12cm)	240
			Double sided(12cm)	480
			Single sided(8cm)	80
			Double sided(8cm)	160
AUDIO-CD	COMPACT disc DIGITAL AUDIO	AUDIO	Single sided(12cm)	74
			Single sided(8cm)	20
DVD-RAM	DVD RAM	AUDIO + VIDEO	Single-sided 12cm (4.7GB)	1 (XP: Excellent Quality)
				2 (SP: Standard Quality)
				4 (LP: Long Playback)
				6 or 8 (EP:Extended)
			Double-sided 12cm (9.4GB)	2 (XP: Excellent Quality)
				4 (SP: Standard Quality)
				8 (LP: Long Playback)
				12 or 16 (EP:Extended)
DVD-RW	DVD RW	AUDIO + VIDEO	12cm (4.7GB)	1 (XP: Excellent Quality)
				2 (SP: Standard Quality)
				4 (LP: Long Playback)
				6 or 8 (EP:Extended)
DVD-R	DVD R	AUDIO + VIDEO	12cm (4.7GB)	1 (XP: Excellent Quality)
				2 (SP: Standard Quality)
				4 (LP: Long Playback)
				6 or 8 (EP:Extended)
CD-RW/-R DVD-RAM/ -RW/-R		JPEG MP3 MPEG4	-	-
HDD	HDD	AUDIO + VIDEO		Approx. 38 (XP: Excellent Quality) Approx. 72 (SP: Standard Quality) Approx. 138 (LP: Long Playback) Approx. 205 or Approx. 272 (EP:Extended)

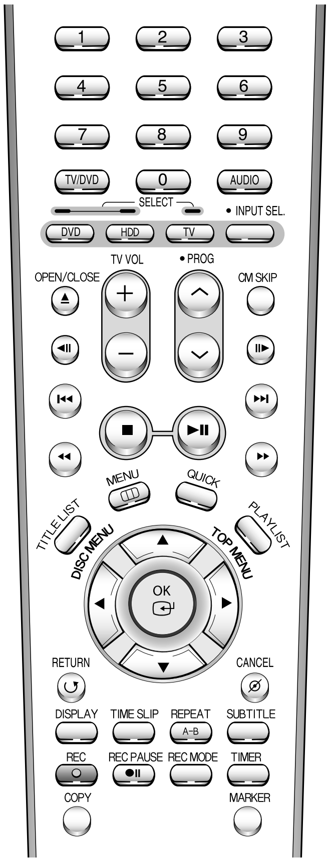
Discs that cannot be played

- DVD-Video with a region number other than “2” or “ALL”
- 12cm 2.6 GB and 5.2 GB DVD-RAM
- 3.9 GB DVD-R Disc for Authoring.
- DVD-RAM/-RW(VR mode) not recorded following the Video Recording Standard
- Unfinalised DVD-R,unfinalised DVD-RW(V mode) recorded on other equipment.
- DVD-ROM/DVD+RW/PD/MV-Disc, etc
- CVD/CD-ROM/CDV/CD-G/CD-I

NOTE

- This HDD & DVD RECORDER can only operate with discs that are compatible with DVD-RAM Standard Version 2.0.
- Playback and/or recording may not work for some types of discs, or when specific operations, such as angle change and aspect ratio adjustment, are being performed. Information about the discs is written in detail on the box. Please refer to this if necessary.
- Do not allow the disc to become dirty or scratched, finger prints, dirt, dust, scratches or deposits of cigarette smoke on the recording surface. For doing so, it may impossible to use the disc for recording.
- DVD-RAM/-RW/-R discs may not be able to play on some DVD players, depending on the player, disc and the condition of the recording.
- Discs with NTSC programmes recorded on them cannot be recorded using this product.

Playing a Disc



1 Press the **OPEN/CLOSE** button.

2 Place a disc gently into the tray with the disc's label facing up.

3 Press **OPEN/CLOSE** button to close the disc tray.

- Your HDD & DVD RECORDER closes the disc tray and the disc will play automatically. For DVD-RAM disc, press **PLAY(⏯)** button in order to start playback.
- The recorder does not play disc automatically after the initial power on.
- When the recorder is powered on and a disc is in the tray, the unit will be activated and wait in stop mode.
- Press the **PLAY(⏯)** button to start playback.
- If you insert an MP3 Disc, your HDD & DVD RECORDER will display the file list on the screen and start playing.
- If you insert a JPEG Disc, folders and files are displayed in the thumbnail picture.
- If you want the unit to play automatically when it is powered on with a disc in the unit, power on with the **PLAY(⏯)** button.

4 Press the **STOP(■)** button to stop playback.

NOTE

- When you stop playing back a disc, the HDD & DVD RECORDER memorizes the point where you stopped. And when you press **PLAY(⏯)** button again, it will playback from the point where you stopped just now. (Unless the disc is removed or the HDD & DVD RECORDER is unplugged, or if you press the **STOP(■)** button twice.)

Caution

- Do not move your HDD & DVD RECORDER while playing, as this may cause damage to the disc.
- Make sure to press the **OPEN/CLOSE** button to open or close the disc tray.
- Do not push the disc tray while it is being opened or closed, as this may cause a product malfunction.
- Do not place foreign materials on or in the disc tray.
- Some functions may perform differently or be disabled depending on the disc type. If this occurs, refer to the instructions written on the disc case.
- Be extra careful that children's fingers are not caught between the disc tray and the tray chassis when it closes.
- You must only insert one DVD disc at a time. Inserting two or more discs will not allow playback and may cause damage to the HDD & DVD RECORDER.

Using the Disc Menu & Top Menu

Some type of discs contain a dedicated menu system that allows you to select special functions for title, chapter, audio track, subtitle, film preview, information on characters, etc.

For DVD-VIDEO Disc

DVD-VIDEO

1 Press the **DISC MENU** button to enter the disc menu of the disc.

- Move to the setup menu related to playback operation.
- You can select audio language and subtitle etc. provided by the disc.

2 Press the **TOP MENU** button to move to the top menu of the disc.

- Press this button if the disc contains more than one title. Some discs may not support the top menu function.

For HDD/DVD-RAM/-RW/-R Disc

HDD DVD-RAM DVD-RW DVD-R

1 Press the **TITLE LIST** button to display title list.

NOTE

- Title List : Title List shows a list to help you select a title. Since the title list consists of the information on video stream that is actually recorded, if one title is deleted, that title cannot be played again.
- Play List : This refers to a unit of playback, which is made by selecting a desired scene in the entire Title List. When one playlist is played, only the scene selected by the user will play and then stop. Since only the information necessary for playing a desired scene is included in a playlist, even if that playlist is deleted, the original recording will not be deleted. (only VR mode)

Using the Search & Skip Functions

Searching through a Chapter or Track

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R MPEG4 CD

1 During play, press the **SEARCH (⏪ ⏩)** buttons on the remote control.

HDD/ DVD-VIDEO/ DVD-RAM/-RW/-R	▶▶ Fast X2 → ▶▶ Fast X4 → ▶▶ Fast X8 → ▶▶ Fast X16 → ▶▶ Fast X32 → ▶▶ Fast X128
MPEG4 AUDIO CD (CD-DA)	▶▶ X2 → ▶▶ X4 → ▶▶ X8 X2 → X4 → X8 (without ▶▶)

- You can scan through the programme in reverse search mode.
  To return to normal speed playback, press the **PLAY (⏯)** button.
- When you press and hold the **SEARCH (⏪ ⏩)** buttons, playback is done at the default speed of X4.
  If you release the **SEARCH (⏪ ⏩)** buttons , playback is performed at a normal speed.
- The speed marked in this function may be different from the actual playback speed.

NOTE

- No sound is heard during Scan(Search) mode, except CDs (CD-DA).

Skipping a Chapter, Track or Marker

During play, you can search quickly through a chapter, track or marker.

1 During play, press the **SKIP (⏮ ⏭)** buttons on the remote control.

- **If you press the SKIP (⏮) button,** it moves to the beginning of the current chapter or track or marker(HDD/DVD-RAM/-RW(VR mode)). Pressing the button once again within 3 seconds, it returns to the beginning of the previous chapter or track or marker(HDD/DVD-RAM/-RW(VR mode)).
- **If you press the SKIP (⏭) button,** it moves to the next chapter or track or marker (HDD/DVD-RAM/-RW(VR mode)).

Slow Motion Play/ Step Motion Play

Slow Motion Play

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R MPEG4

In pause or step mode, press the **SEARCH (⏪ ⏩)** buttons on the remote control.

- **If you press the SEARCH (⏩)button,**
  I▶ Slow 1/8 ➜ I▶ Slow 1/4 ➜ I▶ Slow 1/2
- **If you press the SEARCH (⏪) button,**
  ◀I Slow 1/8 ➜ ◀I Slow 1/4 ➜ ◀I Slow 1/2
- **To return to normal speed playback, press the PLAY (⏯) button.**

Press and hold the **SEARCH (⏪ ⏩)** buttons during pause, the disc will play slowly at a 1/4 speed. If the button is released, the pause operation will resume.

NOTE

- The speed marked in this function may be different from the actual playback speed.
- Slow motion operates only in the forward direction on MPEG4 discs.

Step Motion Play

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R MPEG4

Press the **STEP(◀II II▶)** buttons on the remote control during play.

- Each time the button is pressed, a new frame will appear.
  When the **STEP(◀II)** button is pressed, the previous frame will be activated.
  When the **STEP(II▶)** button is pressed, the next frame will be activated.
- To return to normal speed playback, press the **PLAY (▶II)** button.

NOTE

- Step motion operates only in the forward direction on MPEG4 discs.

About QUICK

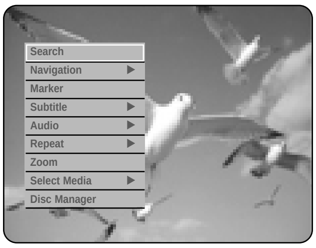
The QUICK function allows you to easily search for a desired scene by accessing title, chapter, track or time. You can also change the subtitle and audio settings and set some features including Marker, Angle, Zoom, Repeat, Select Media and Disc Manager.

Moving to a scene directly using the QUICK

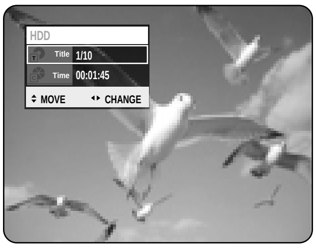
- If you want to move to a title, a chapter or a track to find a desired scene.

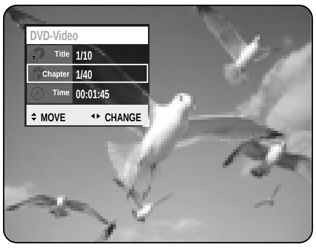
HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R MPEG4

1 Press the **QUICK** button during playback.



2 Press the ▲▼ buttons to select **Search**, then press the **OK** or ▶ button.


HDD
Title 1/10
Time 00:01:45

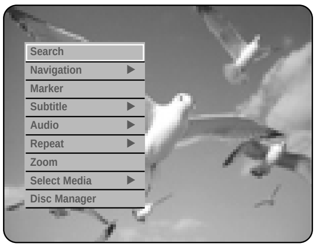

DVD-Video
Title 1/10
Chapter 1/40
Time 00:01:45

3 Press the ▲▼ buttons to select **Title**, **Chapter** or **Track**.

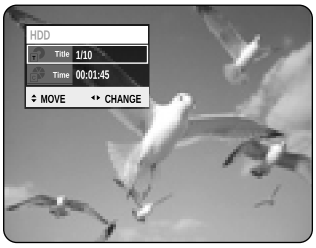
4 Press the ◀▶ buttons or number buttons to select the desired scene, then press the **OK** button.

- If you want to move to a desired time, the following will help you find a scene.

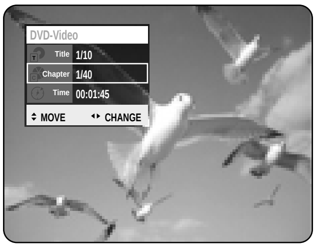
1 Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Search**, then press the **OK** or ▶ button.


HDD
MOVE
CHANGE

Title 1/10
Time 00:01:45


DVD-Video
MOVE
CHANGE

Title 1/10
Chapter 1/40
Time 00:01:45

3 Press the ▲▼ buttons to select **Time.**

4 Enter the time in the sequence of hours, minutes, and seconds using the number buttons, then press the **OK** button.

NOTE

- This may not work for some discs. When an audio CD(CD-DA) or a MP3 disc is inserted, according to a disc type, the information display may not appear.
- The Time Search function does not operate in some discs.
- To make the screen disappear, press the **QUICK** button again.

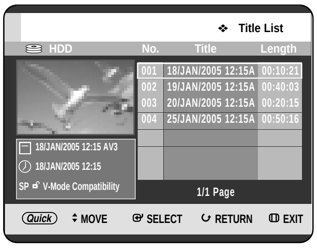
Playing the Title List

Follow these instructions to playback a scene from the Title List.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.

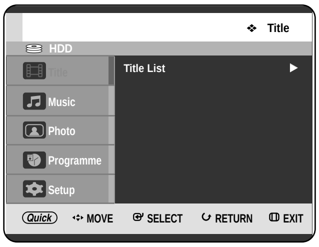


No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.

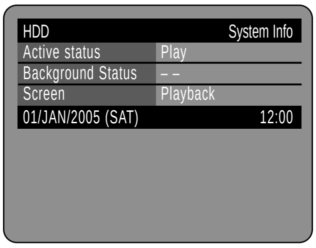


- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

2 Press the ▲▼ buttons to select an entry you want to play from Title List, then press the **OK** or **PLAY (⏯)** button.
The selected entry (title) will be played back.

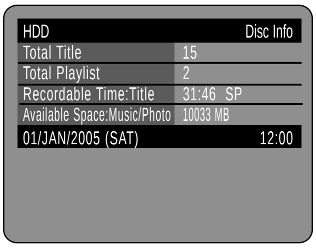
- About DISPLAY button -

During playback, press the **DISPLAY** button once.
The system information screen appears : Displays Active Status, Background Status and Main Screen information.



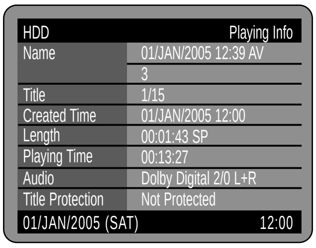
HDD	System Info
Active status	Play
Background Status	– –
Screen	Playback
01/JAN/2005 (SAT)	12:00

During playback, press the **DISPLAY** button twice.
Disc information screen appears : Displays Total numbers of Titles and Playlists, Recordable Time(Title), Available Space(Music/Photo).



HDD	Disc Info
Total Title	15
Total Playlist	2
Recordable Time:Title	31:46 SP
Available Space:Music/Photo	10033 MB
01/JAN/2005 (SAT)	12:00

During playback, press the **DISPLAY** button thrice.
Current playback information screen appears : Displays information of Playback Name, Title, Created Time, Length, Playing Time, Audio and Title protection (if the disc protection is activated).



HDD	Playing Info
Name	01/JAN/2005 12:39 AV 3
Title	1/15
Created Time	01/JAN/2005 12:00
Length	00:01:43 SP
Playing Time	00:13:27
Audio	Dolby Digital 2/0 L+R
Title Protection	Not Protected
01/JAN/2005 (SAT)	12:00

3 To stop title play, press the **STOP (⏹)** button.
To return the title list screen, press the **TITLE LIST** button.

Navigation Menu

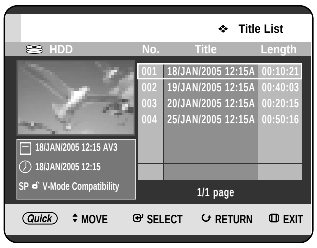
Scene Navigation

If there is a title composed of markers (See page 56), you can search the desired scene using the Scene Navigation.

HDD DVD-RAM DVD-RW
(VR mode)

Using the TITLE LIST button

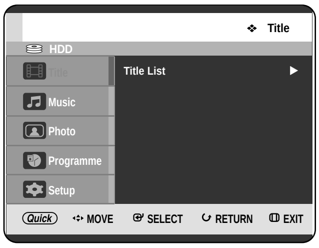
1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 page
Quick MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

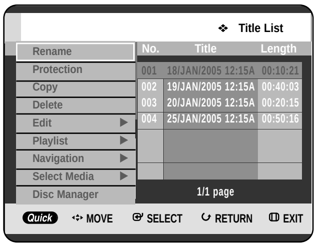
Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.


Title
HDD
Title
Title List
Music
Photo
Programme
Setup
Quick MOVE
SELECT
RETURN
EXIT

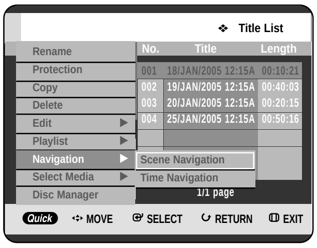
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

2 Press the ▲▼ buttons to select an entry you want to play from Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
1/1 page
Quick MOVE
SELECT
RETURN
EXIT

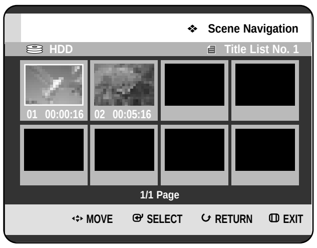
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Navigation**, then press the **OK** or ▶ button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Scene Navigation
Time Navigation
1/1 page
Quick MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

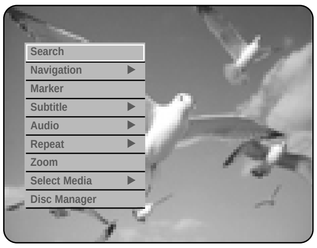
4 Press the ▲▼ buttons to select **Scene Navigation**, then press the **OK** or ▶ button.


Scene Navigation
HDD
Title List No. 1
01 00:00:16
02 00:05:16
1/1 Page
MOVE
SELECT
RETURN
EXIT

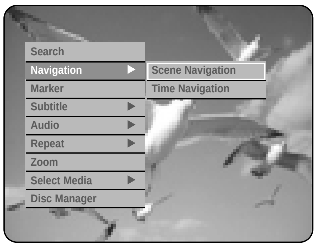
5 Press the ▲▼ ◀▶ buttons to select desired scene, then press the **OK** or **PLAY (▶II)** button.

QUICK Using the QUICK button

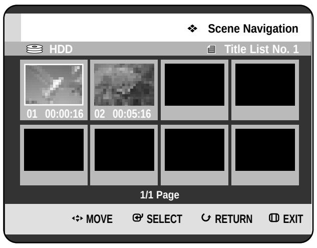
1 Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Navigation**, then press the **OK** or ▶ button.


Search
Navigation ▶
Scene Navigation
Time Navigation
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

3 Press the ▲▼ buttons to select **Scene Navigation**, then press the **OK** or ▶ button.


❖ Scene Navigation
HDD
Title List No. 1
01 00:00:16
02 00:05:16
1/1 Page
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ ◀▶ buttons to select desired scene, then press the **OK** or **PLAY (⏯)** button.

NOTE

- Scene Navigation will not operate if a selected title does not have Markers.

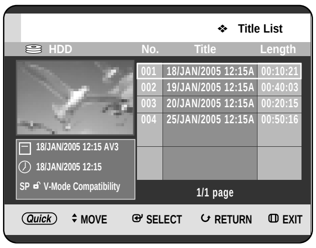
Time Navigation

HDD DVD-RAM DVD-RW (VR mode)

Using this function, you can search scene minute-by-minute from the recorded title list.

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.



❖ Title List

HDD

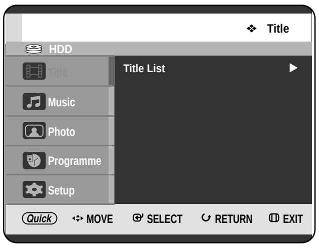
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 page

Quick
MOVE
SELECT
RETURN
EXIT

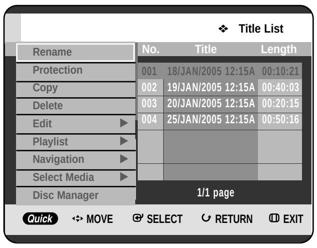
Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.


❖ Title
HDD
Title
Title List ▶
Music
Photo
Programme
Setup
Quick
MOVE
SELECT
RETURN
EXIT

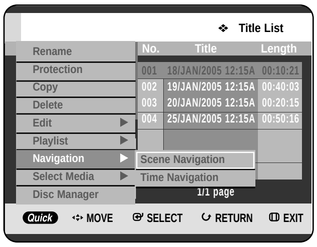
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

2 Press the ▲▼ buttons to select an entry you want to play from Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
1/1 page
Quick MOVE SELECT RETURN EXIT

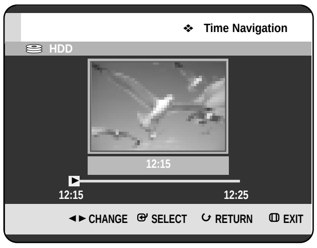
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Navigation**, then press the **OK** or ▶ button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Scene Navigation
Time Navigation
1/1 page
Quick MOVE SELECT RETURN EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

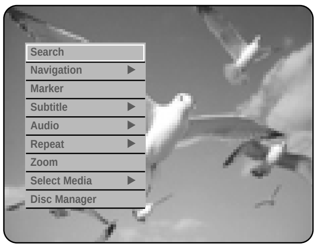
4 Press the ▲▼ buttons to select **Time Navigation**, then press the **OK** or ▶ button.


Time Navigation
HDD
12:15
12:15
12:25
CHANGE SELECT RETURN EXIT

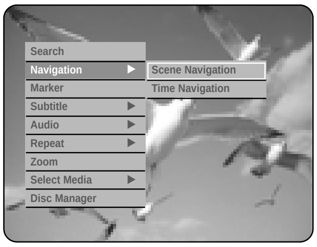
5 Press the ◀▶ buttons to skip one minute at a time and search the desired scene, then press the **OK** or **PLAY (** ⏯ **)** button.

Using the QUICK button

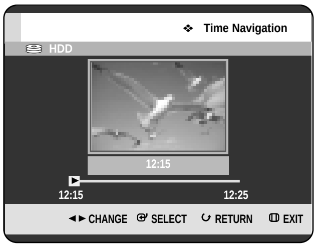
1 Press the **QUICK** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

2 Press the ▲▼ buttons to select **Navigation**, then press the **OK** or ▶ button.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager
Scene Navigation
Time Navigation

3 Press the ▲▼ buttons to select **Time Navigation**, then press the **OK** or ▶ button.


Time Navigation
HDD
12:15
12:15
12:25
CHANGE SELECT RETURN EXIT

4 Press the ◀▶ buttons to skip one minute at a time and search the desired scene, then press the **OK** or **PLAY (** ⏯ **)** button.

NOTE

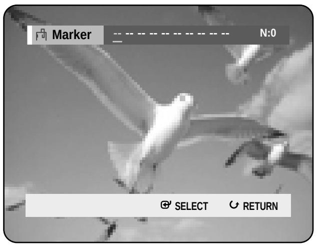
- Cursor does not move if selected recorded title is shorter than 1 minute.
- A disc that has not been recorded by this device may not operates Navigation function.
- An edited title may not display exact search time.

Using the Markers

HDD DVD-RAM DVD-RW
(VR mode)

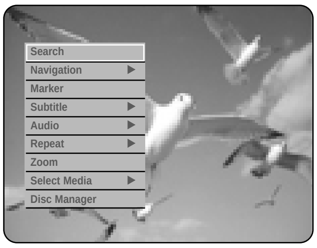
Using the MARKER button

1 Press the **MARKER** button during playback.


Marker
-- -- -- -- -- -- -- -- -- -- --
N:0
SELECT
RETURN

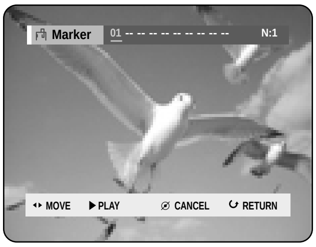
Using the QUICK button.

- Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

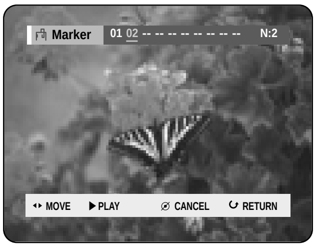
- Press the ▲▼ buttons to select **Marker**, then press the **OK** or ▶ button.

2 Press the **OK** button when the desired scene appears.
- The number **01** is displayed and the scene is memorized.


Marker
01 -- -- -- -- -- -- -- -- -- --
N:1
MOVE
PLAY
CANCEL
RETURN

3 Press the ◀ ▶ buttons to move to the next position.

4 Press the **OK** button again when the desired scene appears.
- The number **02** is displayed and the scene is memorized.

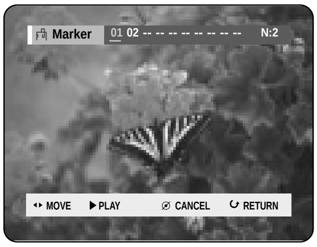

Marker
01 02 -- -- -- -- -- -- -- --
N:2
MOVE
PLAY
CANCEL
RETURN

- HDD, DVD-RAM or DVD-RW (VR Mode) discs have the Marker function instead of the Bookmark function. The Marker function allows you to mark up to 99 scenes. Since the scenes may be displayed as many different pages, numbering is necessary. If a disc is encoded with Disc Protection, Markers cannot be set or deleted. Only playback is available.

Playing back a marker

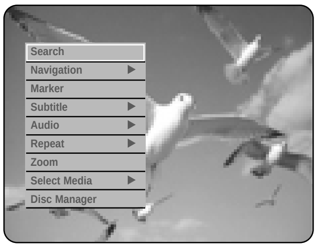
Using the MARKER button

1 Press the **MARKER** button during playback.


Marker
01 02 -- -- -- -- -- -- -- --
N:2
MOVE
PLAY
CANCEL
RETURN

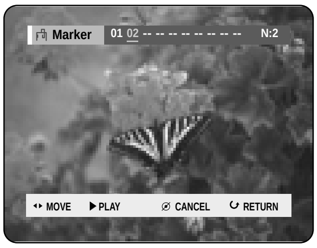
Using the QUICK button.

- Press the **QUICK** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

- Press the ▲▼ buttons to select **Marker**, then press the **OK** or ▶ button.

2 Press the ◀▶ buttons to select a marked scene.


Marker
01 02 -- -- -- -- -- -- -- --
N:2
MOVE
PLAY
CANCEL
RETURN

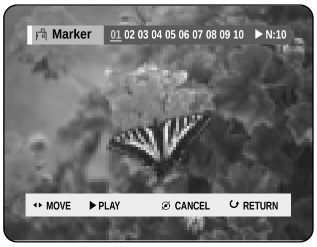
3 Press the **OK** or **PLAY (⏯)** button to start playing from the selected scene.

- If you press the **SKIP (⏮)** button, it moves to the beginning of the marker. Pressing the button once again within 3 seconds, it returns to the beginning of the previous marker.
- If you press the **SKIP (⏭)** button, it moves to the next marker.

Clearing a marker

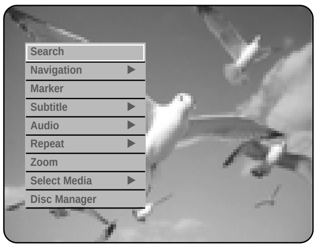
Using the MARKER button

1 Press the **MARKER** button during playback.


Marker
01 02 03 04 05 06 07 08 09 10
▶N:10
MOVE
PLAY
CANCEL
RETURN

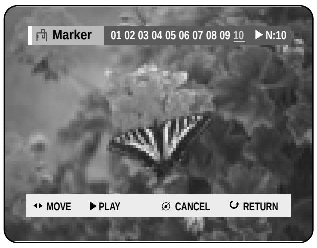
Using the QUICK button.

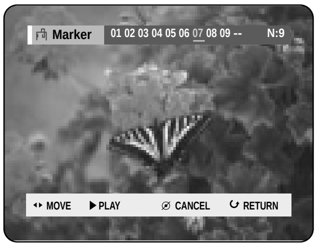
- Press the **QUICK** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

- Press the ▲▼ buttons to select **Marker**, then press the **OK** or ▶ button.

2 Press the ◀▶ buttons to select a marked scene. Press the **CANCEL** button to delete the selected marker.


Marker
01 02 03 04 05 06 07 08 09 10
▶N:10
MOVE
PLAY
CANCEL
RETURN


Marker
01 02 03 04 05 06 07 08 09 --
N:9
MOVE
PLAY
CANCEL
RETURN

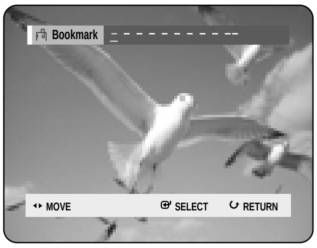
- When a marker is cleared while HDD/DVD-RAM/-RW (VR mode) is playing, marker numbers will change. For example, if the 7th marker is cleared after ten markers are registered, the marker numbers after the eighth will automatically move ahead by one and the 8th marker becomes the 7th.

Using the Bookmarks

DVD-VIDEO DVD-RW DVD-R
(V-mode)

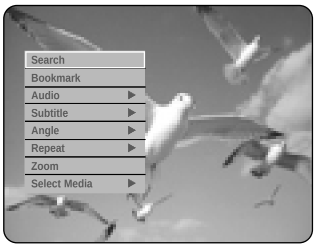
Using the MARKER button

1 Press the **MARKER** button during playback.


Bookmark _ - - - - - - - - - --
MOVE
SELECT
RETURN

Using the QUICK button.

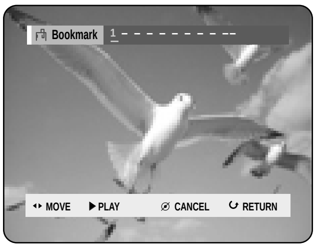
- Press the **QUICK** button during playback.


Search
Bookmark
Audio ▶
Subtitle ▶
Angle ▶
Repeat ▶
Zoom
Select Media ▶

- Press the ▲▼ buttons to select **Bookmark**, then press the **OK** or ▶ button.

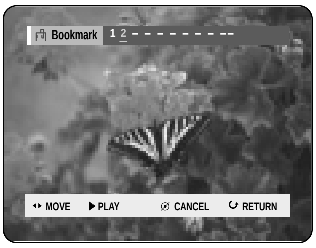
2 Press the **OK** button when the desired scene appears.

- The number **1** is displayed and the scene is memorized.


Bookmark 1 - - - - - - - - --
MOVE
PLAY
CANCEL
RETURN

3 Press the ◀ ▶ buttons to move to the next position.

4 Press the **OK** button again when the desired scene appears.
The number **2** is displayed and the scene is memorized.


Bookmark 1 2 - - - - - - - --
MOVE
PLAY
CANCEL
RETURN

- Repeat above to bookmark other positions.
- You can bookmark up to 10 scenes.

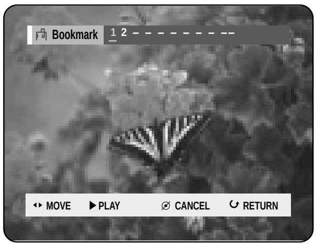
NOTE

- When the disc tray is opened and then closed, bookmarks will disappear.

Playing back a bookmark

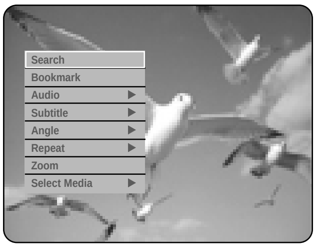
Using the MARKER button

1 Press the **MARKER** button during playback.


Bookmark
1 2 - - - - - - - - --
MOVE
PLAY
CANCEL
RETURN

Using the QUICK button.

- Press the **QUICK** button during playback.


Search
Bookmark
Audio
Subtitle
Angle
Repeat
Zoom
Select Media

- Press the ▲▼ buttons to select **Bookmark**, then press the **OK** or ▶ button.

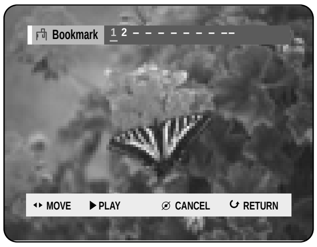
2 Press the ◀▶ buttons to select a bookmarked scene.

3 Press the **OK** or **PLAY(** ⏯ **)** button to start playing from the selected scene.

Clearing a bookmark

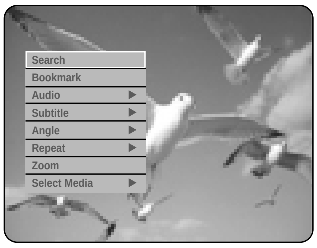
Using the MARKER button

1 Press the **MARKER** button during playback.


Bookmark
1 2 - - - - - - - - --
MOVE
PLAY
CANCEL
RETURN

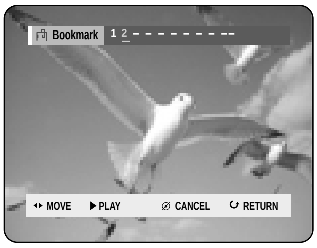
Using the QUICK button.

- Press the **QUICK** button during playback.


Search
Bookmark
Audio
Subtitle
Angle
Repeat
Zoom
Select Media

- Press the ▲▼ buttons to select **Bookmark**, then press the **OK** or ▶ button.

2 Press the ◀▶ buttons to select a bookmarked scene.


Bookmark
1 2 - - - - - - - - --
MOVE
PLAY
CANCEL
RETURN

3 Press the **CANCEL** button to delete the selected bookmark.

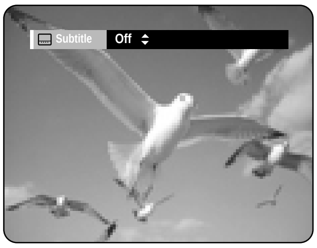
Selecting the Subtitle Language

Selects one of the subtitle language recorded on the disc.

HDD DVD-VIDEO DVD-RAM DVD-RW MPEG4
(VR mode)

Using the SUBTITLE button

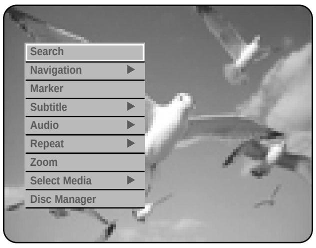
1 Press the **SUBTITLE** button during playback.


Subtitle
Off

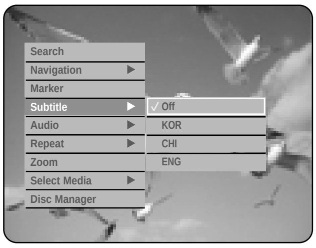
2 Press the ▲▼ buttons to select the desired subtitle language. Also can press the **SUBTITLE** button repeatedly to select the desired subtitle language.
• To make the screen disappear, press the **CANCEL** or **RETURN** button.

Using the QUICK button

1 Press the **QUICK** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

2 Press the ▲▼ buttons to select **Subtitle**, then press the **OK** or ▶ button.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager
✓ Off
KOR
CHI
ENG

3 Press the ▲▼ buttons to select the desired subtitle language, then press the **OK** or ▶ button.

NOTE

- The subtitle display may be different depending on the disc type.
- Some discs allow you to select the language for the disc menu only.

Selecting the Soundtracks & Audio Channels

Selecting the Audio

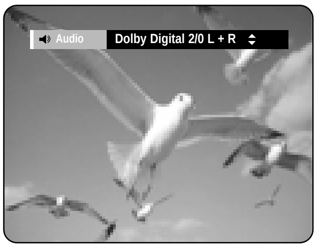
Selects one of the soundtracks or audio channels recorded on the disc.

HDD DVD-VIDEO DVD-RAM DVD-RW MPEG4
(VR mode)

Using the AUDIO button

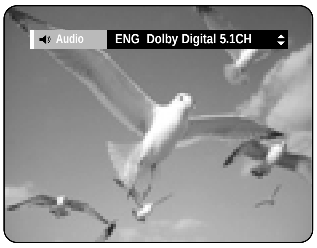
1 Press the **AUDIO** button during playback.

HDD/DVD-RAM/-RW



Audio Dolby Digital 2/0 L + R

DVD-VIDEO

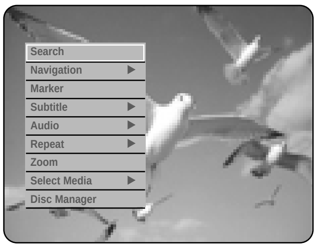


Audio ENG Dolby Digital 5.1CH

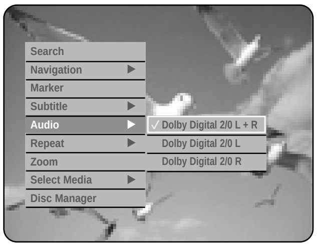
2 Press the ▲▼ buttons to select the desired soundtracks or audio channel. Also can press the **AUDIO** button repeatedly to select the desired soundtracks or audio channel.
• To make the screen disappear, press the **CANCEL** or **RETURN** button.

Using the QUICK button

1 Press the **QUICK** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

2 Press the ▲▼ buttons to select **Audio**, then press the **OK** or ▶ button.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager
✓ Dolby Digital 2/0 L + R
Dolby Digital 2/0 L
Dolby Digital 2/0 R

3 Press the ▲▼ buttons to select the desired soundtracks or audio channel, then press the **OK** or ▶ button.

NOTE

- Soundtracks or Audio channel may be different because they are disc-specific.
- Some discs allow you to select the audio language for the disc menu only.

Changing the Camera Angle

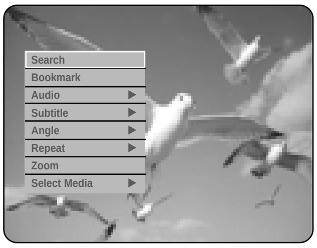
When a HDD & DVD RECORDER contains multiple angles of a particular scene, you can select the Angle function.

DVD-VIDEO

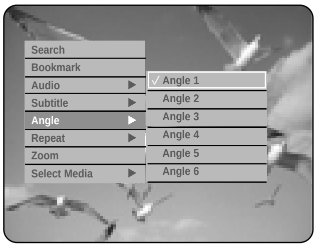
QUICK

Using the QUICK button

1 Press the **QUICK** button during playback.


Search
Bookmark
Audio ▶
Subtitle ▶
Angle ▶
Repeat ▶
Zoom
Select Media ▶

2 Press the ▲▼ buttons to select **Angle**, then press the **OK** or ▶ button.


Search
Bookmark
Audio ▶
Subtitle ▶
Angle ▶
Repeat ▶
Zoom
Select Media ▶
✓ Angle 1
Angle 2
Angle 3
Angle 4
Angle 5
Angle 6

3 Press the ▲▼ buttons to select the desired angle, then press the **OK** or ▶ button.

NOTE

- This function is disc-dependent. It may not work for some DVDs.
- This function does not work when a DVD has not been recorded with a multi-camera angle system.

Repeat Play

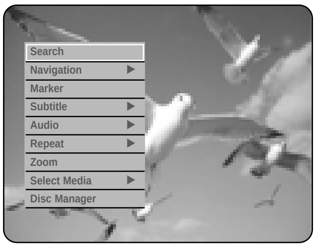
Playing Repeatedly(Repeat Playback)

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R MPEG4

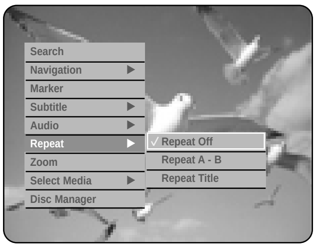
QUICK

Using the QUICK button

1 Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select the **Repeat**, then press the **OK** or ▶ button.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
✓ Repeat Off
Repeat A - B
Repeat Title

3 Press the ▲▼ buttons to select **Repeat Off**, **Repeat A-B**, **Repeat Title**, **Repeat Folder** or **Repeat Chapter** you want to play repeatedly, then press the **OK** or ▶ button.

- **Repeat Off** : Resumes normal playback.
- **Repeat A-B** : Repeats a segment of the disc that you select.
- **Repeat Title** : Repeats the current title.
- **Repeat Folder** : Repeats the current MPEG4 folder.
- **Repeat Chapter** : Repeats the chapter within the current title.

NOTE

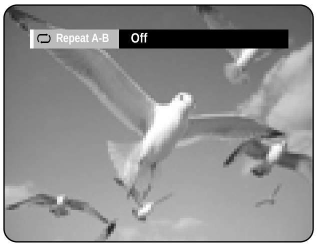
- HDD/DVD-RAM/-RW(VR mode), unfinalised DVD-R and unfinalised DVD-RW (V mode) do not repeat a chapter.

Repeat A-B

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R

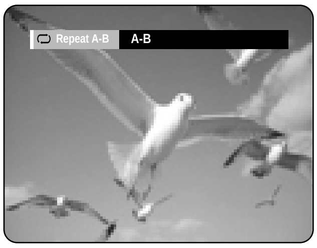
Using the REPEAT A-B button

1 Press the **REPEAT A-B** button during playback.



Repeat A-B Off

2 Press the **OK** button at the point where you want the repeat play to start (A) and press it again at the point where you want the repeat play to stop (B). Repeat playback of the A-B section starts.

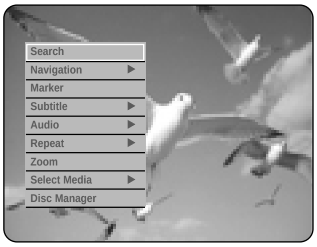


Repeat A-B A-B

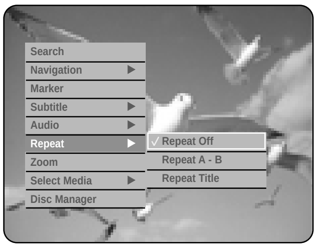
QUICK

Using the QUICK button

1 Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Repeat**, then press the **OK** or ▶ button.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
√ Repeat Off
Repeat A - B
Repeat Title

3 Press the ▲▼ buttons to select **Repeat A-B**, then press the **OK** or ▶ button.

4 Press the **OK** button at the point where you want the repeat play to start (A) and press it again at the point where you want the repeat play to stop (B).Repeat playback of the A-B section starts.

- To return to normal playback -

5 Press the **CANCEL** button to return to normal playback.

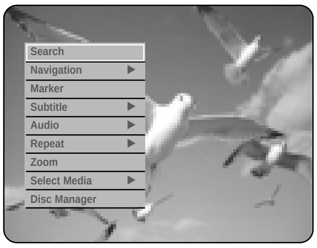
NOTE

- If you set point (B) before five seconds has lapsed, the prohibition mark (⊘) will appear.
- You can also activate Normal Playback by pressing the **CANCEL** button.
- Audio CDs(CD-DA), MP3 discs and MPEG4 discs do not support the Repeat A-B function.

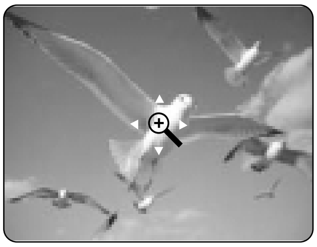
Zooming-In

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R

1 Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Zoom**, then press the **OK** or ▶ button. (🔍) will be displayed.



3 Press ▲▼ ◀ ▶ buttons to move to the area you want to enlarge.

4 Press the **OK** button.
The screen will be enlarged to twice the normal size. The screen size will be enlarged to four times the normal size.

HDD/DVD-VIDEO/ DVD-RAM/-RW/-R	normal size ➝ x2 ➝ x4 ➝ x2 ➝ normal size

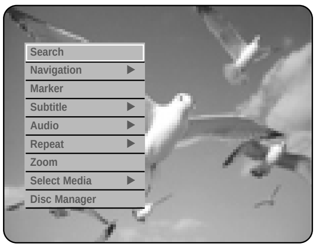
NOTE

- When recording is done in the EP mode, the Zoom function will not be supported except when the recording has been done in V mode.

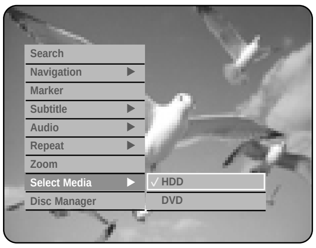
Select Media

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R

1 Press the **QUICK** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Select Media**, then press the **OK** or ▶ button.

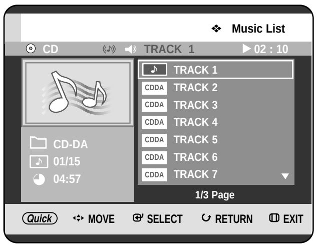

Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
√ HDD
DVD

3 Press the ▲▼ buttons to select **HDD** or **DVD**, then press the **OK** or ▶ button.

Playing an Audio CD/MP3

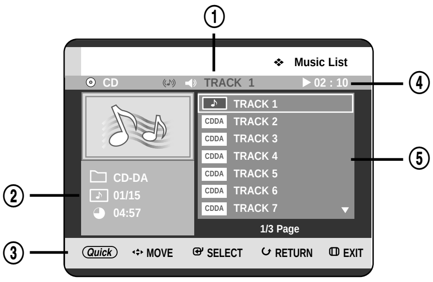
Playing an Audio CD(CD-DA)

1 Insert an audio CD (CD-DA) into the disc tray.
- The audio CD menu appears and the tracks (songs) are played automatically.


Music List
CD
TRACK 1
▶ 02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

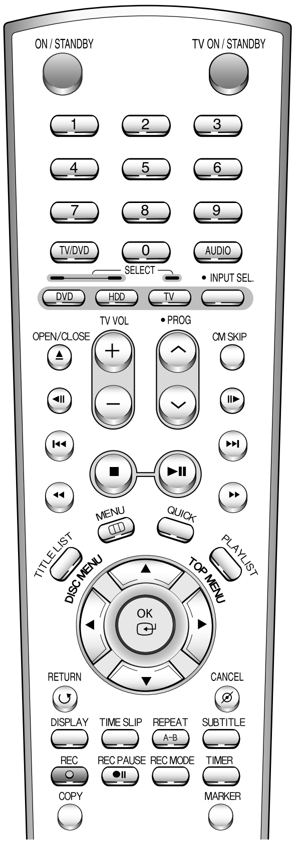
2 Press the ▲▼ buttons to select the track (song) you want to hear, and then press the **OK** button.

Audio CD(CD-DA) Screen Elements


①
②
③
④
⑤
Music List
CD
TRACK 1
▶ 02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

1. **Current track (song)**: Displays the current track number being played.
2. Displays the current play index, total track number.
3. Display available buttons.
4. This shows the operating state of a disc and the current elapsed play time.
5. Displays the track list (song list).

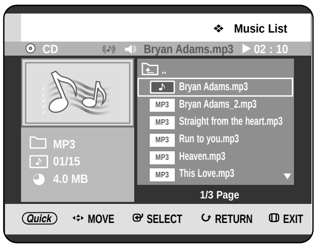
Buttons on the Remote Control used for Audio CD(CD-DA) playback


ON / STANDBY
TV ON / STANDBY
1
2
3
4
5
6
7
8
9
TV/DVD
0
AUDIO
SELECT
INPUT SEL.
DVD
HDD
TV
TV VOL
PROG
OPEN/CLOSE
CM SKIP
MENU
QUICK
TITLE LIST
PLAYLIST
DISC MENU
TOP MENU
OK
RETURN
CANCEL
DISPLAY
TIME SLIP
REPEAT
A-B
SUBTITLE
REC
REC PAUSE
REC MODE
TIMER
COPY
MARKER

1. ▲▼ **buttons:** Selects a track (song).
2. ◀▶ **buttons:** Move the page up/down.
3. **OK button:** Plays the selected track (song).
4. **SKIP (⏭) button:** Plays the next track.
5. **SKIP (⏮) button:** Returns to the beginning of the current track when pressed during playback.
   If pressed again within 3 seconds, your HDD & DVD RECORDER will play the previous track.
6. **SEARCH (⏪ ⏩) buttons:** Fast Play (X2, X4, X8)
7. **STOP (■) button:** Stops a track(song).
8. **PLAY (⏯) button:** Plays a track(song) or pauses playback.
9. **QUICK button**: The QUICK menu is displayed. (**Play Mode**, **Go To Playlist** or **New Playlist**).

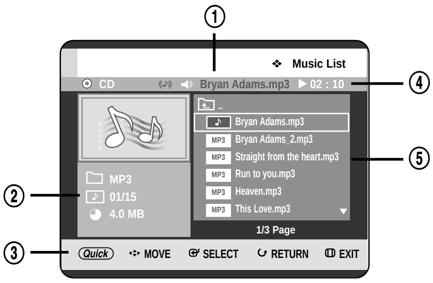
Playing a MP3 Disc

1 Insert a MP3 disc into the disc tray.
- The MP3 menu is displayed and the tracks (songs) are played automatically.


Music List
CD
Bryan Adams.mp3 ▶ 02 : 10
..
Bryan Adams.mp3
Bryan Adams_2.mp3
Straight from the heart.mp3
Run to you.mp3
Heaven.mp3
This Love.mp3
MP3
01/15
4.0 MB
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select the track you want to hear, and then press the **OK** button.

MP3 Screen Elements

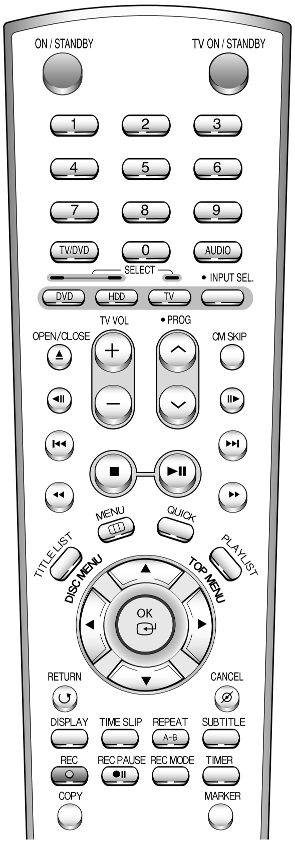

①
②
③
④
⑤
Music List
CD
Bryan Adams.mp3 ▶ 02 : 10
..
Bryan Adams.mp3
Bryan Adams_2.mp3
Straight from the heart.mp3
Run to you.mp3
Heaven.mp3
This Love.mp3
MP3
01/15
4.0 MB
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

1. **Current track (song):** Displays the name of the current track being played.
2. Displays the current folder, play index and current track size.
3. Displays available buttons.
4. This shows the operating state of a disc and the current elasped play time.
5. Displays the information of the folder and its tracks.

NOTE

- If a disc contains only MP3 files or only JPEG files, the MP3 or JPEG screen appears after the disc is loaded.
- If a disc contains a mixture of MP3 and JPEG files, you need to select Music for MP3 files or Photo for JPEG files.

Buttons on the Remote Control used for MP3 playback

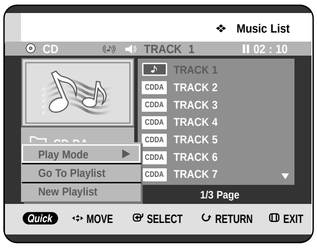

ON / STANDBY
TV ON / STANDBY
1
2
3
4
5
6
7
8
9
TV/DVD
0
AUDIO
SELECT
INPUT SEL.
DVD
HDD
TV
TV VOL
PROG
OPEN/CLOSE
CM SKIP
MENU
QUICK
TITLE LIST
DISC MENU
TOP MENU
PLAY LIST
OK
RETURN
CANCEL
DISPLAY
TIME SLIP
REPEAT
A-B
SUBTITLE
REC
REC PAUSE
REC MODE
TIMER
COPY
MARKER

1. **▲▼ buttons:** Selects a track (song).
2. **◀▶ buttons:** Move the page up/down.
3. **OK button:** Plays the selected track (song).
4. **SKIP (⏭) button:** Plays the next track.
5. **SKIP (⏮) button:** Returns to the beginning of the current track when pressed during playback. If pressed again within 3 seconds, your HDD & DVD RECORDER will play the previous track.
6. **STOP (■) button:** Stops a track(song).
7. **PLAY (▶II) button:** Plays a track(song) or pauses playback.
8. **QUICK button**: The QUICK menu is displayed. (**Copy**, **Play Mode**, **Go To Playlist**, **New Playlist** or **Select Media**).

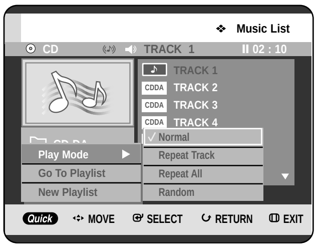
Repeat CD (CD-DA) & MP3

QUICK Using the QUICK button

1 Press the **QUICK** button during the Music List playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Play Mode**, then press the **OK** or ▶ button.


Music List
CD
TRACK 1
02 : 10
Play Mode
Go To Playlist
New Playlist
Normal
Repeat Track
Repeat All
Random
Quick
MOVE
SELECT
RETURN
EXIT

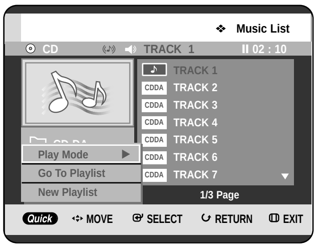
3 Press the ▲▼ buttons to select desired play mode, then press the **OK** or ▶ button.

- **Normal (CD (CD-DA)/MP3):** All tracks on a disc are played in the order in which they were recorded on the disc.
- **Repeat Track (CD (CD-DA)/MP3):** Repeats the current track.
- **Repeat Folder (MP3):** Repeats all tracks within a folder.
- **Repeat All (CD (CD-DA)/MP3):** Repeats all tracks on a disc.
- **Random (CD (CD-DA)/MP3):** All tracks on a disc are played in random order.

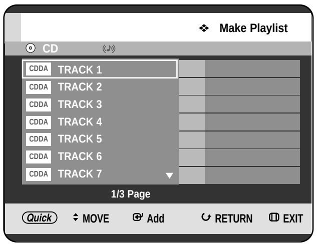
New Playlist

You can register a maximum 28 tracks in the playlist.

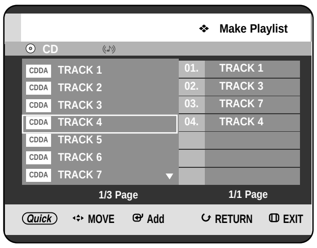
1 Press the **QUICK** button during the Music List playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

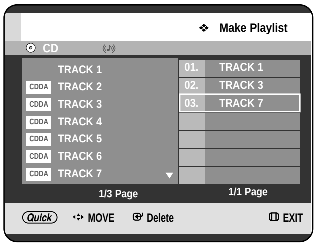
2 Press the ▲▼ buttons to select **New Playlist**, then press the **OK** or ▶ button.


Make Playlist
CD
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
1/3 Page
Quick
MOVE
Add
RETURN
EXIT

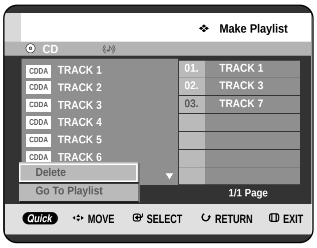
3 Press the ▲▼ buttons to select tracks in order in which you want them to play, then press the **OK** button.


Make Playlist
CD
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
01. TRACK 1
02. TRACK 3
03. TRACK 7
04. TRACK 4
1/3 Page
1/1 Page
Quick
MOVE
Add
RETURN
EXIT

4 If you playlisted a wrong track, press the ►▲▼ buttons to select the wrong track, then press the **OK** or **CANCEL** button. The wrong track is removed.


Make Playlist
CD
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
01. TRACK 1
02. TRACK 3
03. TRACK 7
1/3 Page
1/1 Page
Quick MOVE Delete EXIT

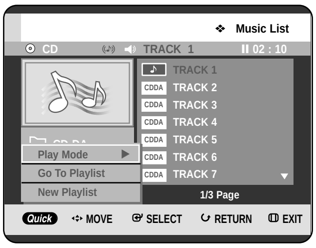
5 To store the Playlist, press the **QUICK** button.


Make Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
Delete
Go To Playlist
01. TRACK 1
02. TRACK 3
03. TRACK 7
1/1 Page
Quick MOVE SELECT RETURN EXIT

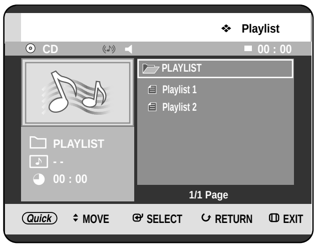
6 Press the ▲▼ buttons to select the **Go To Playlist**, then press the **OK** button.
A new **Playlist** is created.

Go To Playlist

1 Press the **QUICK** button during the Music List playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
Play Mode ►
Go To Playlist
New Playlist
1/3 Page
Quick MOVE SELECT RETURN EXIT

2 Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ► button.

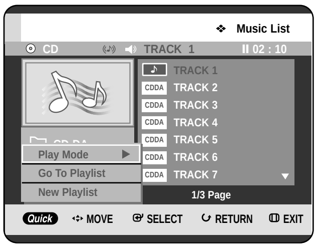

Playlist
CD
00 : 00
PLAYLIST
Playlist 1
Playlist 2
PLAYLIST
- -
00 : 00
1/1 Page
Quick MOVE SELECT RETURN EXIT

3 Press the ▲▼ buttons to select the desired playlist folder, then press the **OK** button.

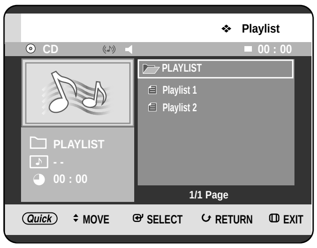
4 The selected tracks are played automatically.

Delete the Playlist

1 Press the **QUICK** button during the Music List playback.

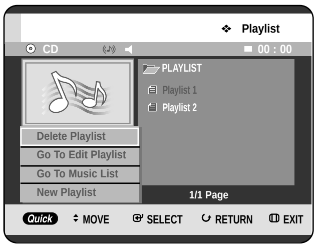

Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
CDDA
Play Mode
Go To Playlist
New Playlist
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ▶ button.

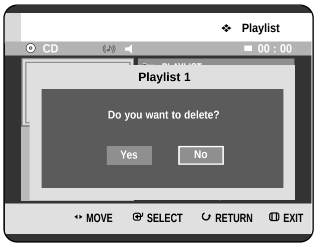

Playlist
CD
00 : 00
PLAYLIST
Playlist 1
Playlist 2
PLAYLIST
- -
00 : 00
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the **Playlist** you want to delete.

4 Press the **QUICK** button.


Playlist
CD
00 : 00
PLAYLIST
Playlist 1
Playlist 2
Delete Playlist
Go To Edit Playlist
Go To Music List
New Playlist
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select the **Delete Playlist**, then press the **OK** or ▶ button.


Playlist 1

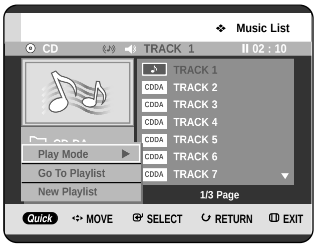
Do you want to delete?

Playlist
CD
00 : 00
Yes
No
MOVE
SELECT
RETURN
EXIT

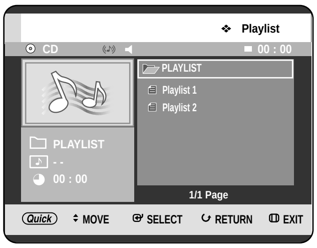
6 Press the ◀▶ buttons to select **Yes**, then press the **OK** button. The selected Playlist is deleted.

Go To Edit Playlist

1 Press the **QUICK** button during the Music List playback.

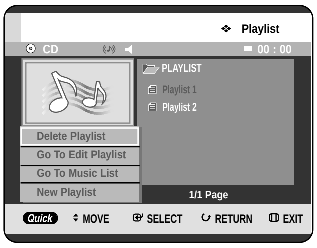

Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
CDDA
Play Mode
Go To Playlist
New Playlist
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ▶ button.

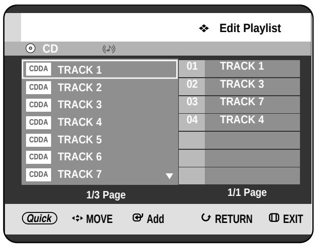

Playlist
CD
00 : 00
PLAYLIST
Playlist 1
Playlist 2
PLAYLIST
- -
00 : 00
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the **Playlist** you want to edit.

4 Press the **QUICK** button in playlist mode.


Playlist
CD
00 : 00
PLAYLIST
Playlist 1
Playlist 2
Delete Playlist
Go To Edit Playlist
Go To Music List
New Playlist
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

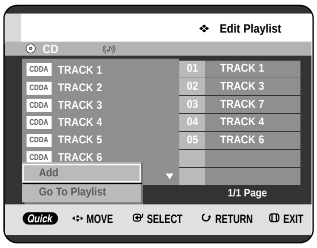
5 Press the ▲▼ buttons to select the **Go To Edit Playlist**, then press the **OK** or ▶ button.


Edit Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
01 TRACK 1
02 TRACK 3
03 TRACK 7
04 TRACK 4
1/3 Page
1/1 Page
Quick MOVE Add RETURN EXIT

6 Press the ▲▼ buttons to select tracks in order in which you want them to play, then press the **OK** button.

7 If you playlisted a wrong track, press the ▶▲▼ buttons to select the wrong track, then press the **OK** or **CANCEL** button.

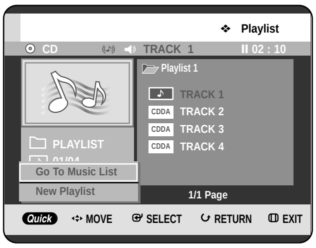
8 To store the Playlist, press the **QUICK** button.


Edit Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
Add
Go To Playlist
01 TRACK 1
02 TRACK 3
03 TRACK 7
04 TRACK 4
05 TRACK 6
1/1 Page
Quick MOVE SELECT RETURN EXIT

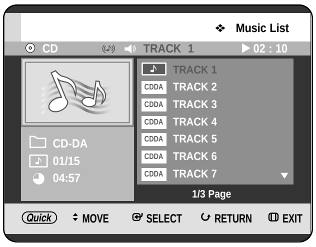
9 Press the ▲▼ buttons to select the **Go To Playlist**, then press the **OK** button.
The Playlist is edited.

Go To Music List

1 Press the **QUICK** button during the Playlist playback.

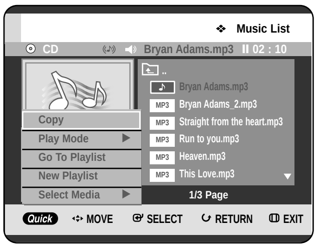

Playlist
CD
TRACK 1
02 : 10
Playlist 1
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
PLAYLIST
Go To Music List
New Playlist
1/1 Page
Quick MOVE SELECT RETURN EXIT

2 Press the ▲▼ buttons to select **Go To Music List**, then press the **OK** or ▶ button.

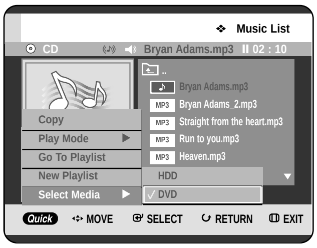

Music List
CD
TRACK 1
02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Quick MOVE SELECT RETURN EXIT

Select Media (MP3)

1 Press the **QUICK** button.


Music List
CD
Bryan Adams.mp3 II 02 : 10
..
Bryan Adams.mp3
MP3 Bryan Adams_2.mp3
MP3 Straight from the heart.mp3
MP3 Run to you.mp3
MP3 Heaven.mp3
MP3 This Love.mp3
Copy
Play Mode
Go To Playlist
New Playlist
Select Media
1/3 Page
Quick MOVE SELECT RETURN EXIT

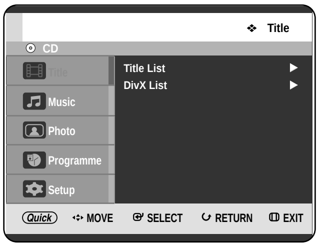
2 Press the ▲▼ buttons to select **Select Media**, then press the **OK** or ▶ button.


Music List
CD
Bryan Adams.mp3 II 02 : 10
..
Bryan Adams.mp3
MP3 Bryan Adams_2.mp3
MP3 Straight from the heart.mp3
MP3 Run to you.mp3
MP3 Heaven.mp3
Copy
Play Mode
Go To Playlist
New Playlist
Select Media
HDD
✓ DVD
Quick MOVE SELECT RETURN EXIT

3 Press the ▲▼ buttons to select **HDD** or **DVD**, then press the **OK** or ▶ button.
If there are no mp3 files on the selected media, it notifies you that there are no mp3 files and the media will not be switched.

Playing a Picture

1 Insert a JPEG disc or Mixed disc (JPEG + MP3 + DivX) into the disc tray.


Title
CD
Title
Music
Photo
Programme
Setup
Title List
DivX List
Quick MOVE SELECT RETURN EXIT

2 Press the ▲▼ buttons to select **Photo**, then press the **OK** or ▶ button.

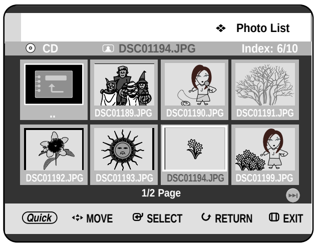


Photo List
CD
DSC01194.JPG
Index: 6/10
..
DSC01189.JPG
DSC01190.JPG
DSC01191.JPG
DSC01192.JPG
DSC01193.JPG
DSC01194.JPG
DSC01199.JPG
1/2 Page
Quick MOVE SELECT RETURN EXIT

- To see the next 8 pictures, press the **SKIP (⏭)** button.
- To see the previous 8 pictures, press the **SKIP (⏮)** button.

3 Press the ▲▼ ◀ ▶ buttons to select a picture, then press the **OK** button.

- To view the previous/next picture, press the **SKIP (⏮ ⏭)** buttons respectively.

NOTE

- If a disc contains only MP3 files or only JPEG files, the MP3 or JPEG screen appears after the disc is loaded.
- If a disc contains a mixture of MP3 and JPEG files, you need to select Music for MP3 files or Photo for JPEG files.

Slide Show

4 Press the **QUICK** button.

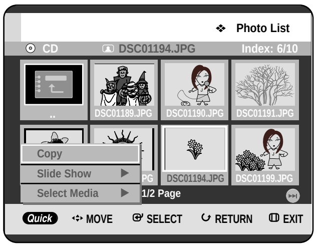


Photo List
CD
DSC01194.JPG
Index: 6/10
..
DSC01189.JPG
DSC01190.JPG
DSC01191.JPG
Copy
Slide Show ▶
Select Media ▶
DSC01194.JPG
DSC01199.JPG
1/2 Page
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Slide Show**, then press the **OK** or ▶ button.

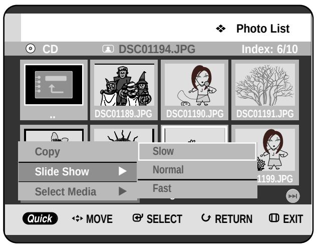
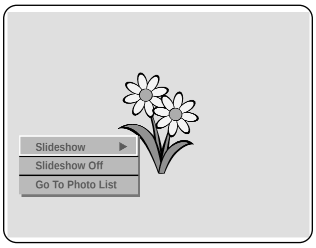


Photo List
CD
DSC01194.JPG
Index: 6/10
..
DSC01189.JPG
DSC01190.JPG
DSC01191.JPG
Copy
Slide Show ▶
Select Media ▶
Slow
Normal
Fast
Quick
MOVE
SELECT
RETURN
EXIT

6 Press the ▲▼ buttons to select the slide show speed, then press the **OK** or ▶ button.
The slide show starts.

- To stop the Slide Show -

1 Press the **QUICK** button.

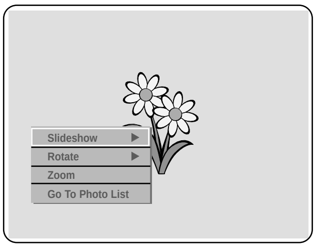

Slideshow ▶
Slideshow Off
Go To Photo List

2 Press the ▲▼ buttons to select **Slideshow Off**, then press the **OK** or ▶ button.

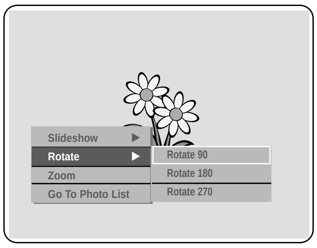
Rotate

To setup, follow steps 1 to 3 on page 71.

4 Press the **OK** button to select the picture you want to see, then press the **QUICK** button.


Slideshow ▶
Rotate ▶
Zoom
Go To Photo List

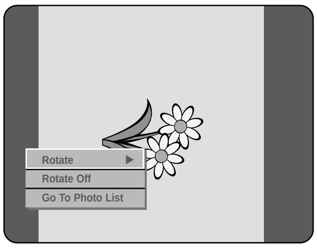
5 Press the ▲▼ buttons to select **Rotate**, then press the **OK** or ▶ button.


Slideshow ▶
Rotate ▶
Zoom
Go To Photo List
Rotate 90
Rotate 180
Rotate 270

6 Press the ▲▼ buttons to select the rotate angle, then press the **OK** or ▶ button.

- To cancel the Rotate -

1 Press the **QUICK** button.

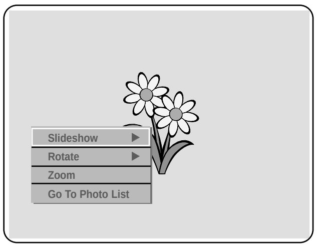

Rotate ▶
Rotate Off
Go To Photo List

2 Press the ▲▼ buttons to select **Rotate Off**, then press the **OK** or ▶ button.

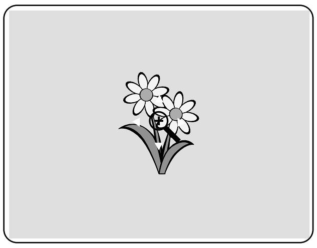
Zoom

To setup, follow steps 1 to 3 on page 71.

4 Press the **OK** button to select the picture you want to see, then press the **QUICK** button.


Slideshow ▶
Rotate ▶
Zoom
Go To Photo List

5 Press the ▲▼ buttons to select **Zoom**, then press the **OK** or ▶ button. (🔍) will be displayed.



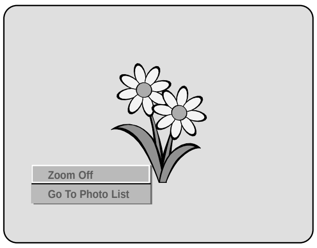
6 Press ▲▼ ◀ ▶ buttons to move to the area you want to enlarge.

7 Each time the **OK** button is pressed, the picture is enlarged up to 4x(four times the normal size).

→ X2 → X4 → X2 → Normal

- To stop the Zoom -

1 Press the **QUICK** button.

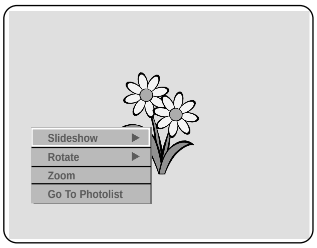

Zoom Off
Go To Photo List

2 Press the ▲▼ buttons to select **Zoom Off**, then press the **OK** or ▶ button.

Go To Photo List

To setup, follow steps 1 to 3 on page 71.

4 Press the **OK** button to select the picture you want to see, then press the **QUICK** button.


Slideshow ▶
Rotate ▶
Zoom
Go To Photolist

5 Press the ▲▼ buttons to select **Go To Photo List**, then press the **OK** or ▶ button.

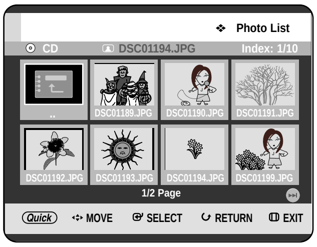


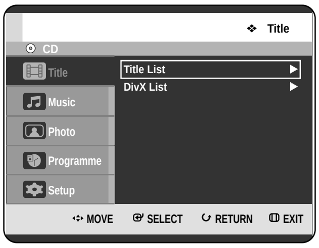
Photo List
CD
DSC01194.JPG
Index: 1/10
..
DSC01189.JPG
DSC01190.JPG
DSC01191.JPG
DSC01192.JPG
DSC01193.JPG
DSC01194.JPG
DSC01199.JPG
1/2 Page
Quick
MOVE
SELECT
RETURN
EXIT

Playing an MPEG4

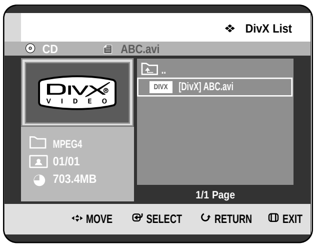
Using the MENU button

1 Insert a DivX disc or Mixed disc (JPEG + MP3 + DivX) into the disc tray.

2 Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button.
(In case of playing a DivX CD, see step 4 below.)


Title
CD
Title
Music
Photo
Programme
Setup
Title List ▶
DivX List ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **DivX List**, then press the **OK** or ▶ button.
The DivX List screen is displayed.


DivX List
CD
ABC.avi
DIVX VIDEO
..
[DivX] ABC.avi
MPEG4
01/01
703.4MB
1/1 Page
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select the avi file (DivX), then press the **OK** or **PLAY (⏯)** button.

5 When MPEG4 file is played, you can use the following functions below. Press the **STOP (⏹)** button once during playback, the filelist is displayed. Pressing the button again to exit the menu screen.

MPEG4 Function Description

Function	Description
Skip	During play, press the **SKIP (⏮⏭)** buttons, it moves forward or backward.
Search	During play, press the **SEARCH (⏪⏩)** buttons and press again to search at a faster speed. (X2, X4, X8)
Slow Motion Play	In pause or step mode, press the **SEARCH (⏩)** button on the remote control. (X1/8, X1/4, X1/2)
Step Motion Play	During play, press the **STEP (▶)** button on the remote control in the still mode.

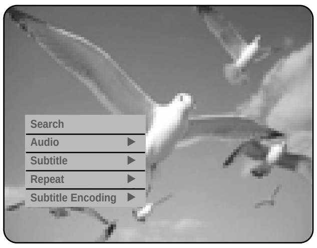
NOTE

- This unit can play the following video compression formats,
  - MPEG4 Codec format : DivX 3.11 DivX 4.x DivX 5.x (without QPEL and GMC)
  - Audio format : .MP3, .MPEG, .WMA, .LPCM, .AC3
- Supported subtitle file formats: .smi, .srt, .sub, .psb, .txt, .ass (The subtitle file should have exactly the same name to corresponding MPEG4 file name)
- Some MPEG4 files created on a personal computer may not be play back.

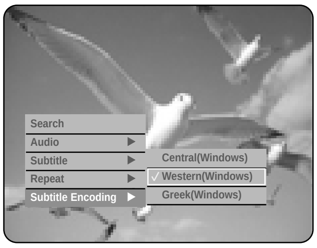
  That is why Codec Type, Version and Higher resolution over specification is not supported.

DivX Subtitle Encoding

1 Press the **QUICK** button during playback.



2 Press the ▲▼ buttons to select **Subtitle Encoding**, then press the **OK** or ▶ button.



3 Press the ▲▼ buttons to select a supported DivX subtitle language by region, then press the **OK** or ▶ button.

Western	English, Breton, Catalan, Danish, Dutch, Faroese, Finnish, French, Gaelic, German, Icelandic, Irish, Italian, Norwegian, Portuguese, Spanish and Swedish
Central	English, Albanian, Croatian, Czech, Hungarian, Polish, Romanian, Slovak, Slovene and Serbian(Latin)
Greek	English and modern Greek

NOTE

- If the subtitle language is displayed in broken fonts, change DivX Subtitle to the appropriate region. If it still does not work, the format is not supported.

Recording

This section shows various HDD & DVD Recording methods.

Before Recording 76
Recording the current TV programme you are watching 78
Recording from external equipment you are watching 80
Copying from a Camcorder 81
Making an One Touch Recording (OTR) 82
Watching the Images Being Recorded (Time Slip) . .83
Chasing Play 84
Simultaneous Recording and Playback 85
Making a Timer Recording 86
Flexible Recording (for Timer recording only) 88
Editing the Timer Record List 88
Deleting a Timer Record List 89
Go To History List 90
Using the ShowView Feature 93
ShowView Extended 94

Before Recording

This unit can record on various types of discs. Before recording, read the following instructions and select the disc type according to your preference.

Recordable Discs

This recorder can record on the following discs.

HDD	DVD-RAM	DVD-RW	DVD-R
HDD	DVD RAM	DVD RW	DVD R

•DVD-RWs and DVD-RAMs are rewritable.
•DVD-Rs are non-rewritable.

Compatibility between Toshiba and Other Company's Recorder

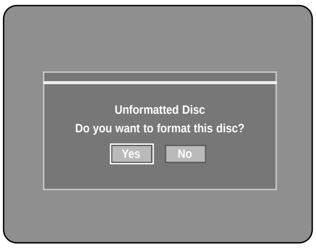
Disc Types	Recording format	Recording Device	Finalising	Additional Recording in Toshiba Recorder
DVD-RAM	VR Mode	Toshiba	X	Recordable
		Other Company	X	Recordable
DVD-RW	VR Mode	Toshiba	finalised	Not recordable
			not finalised	Recordable
		Other Company	finalised	Not recordable
			not finalised	Recordable
	V Mode	Toshiba	finalised	Not recordable
			not finalised	Recordable
		Other Company	finalised	Not recordable
			not finalised	Not recordable
DVD-R	V Mode	Toshiba	finalised	Not recordable
			not finalised	Recordable
		Other Company	finalised	Not recordable
			not finalised	Not recordable

NOTE

- Finalise
  - This closes the DVD-RW/-R so that no additional recording can be done.
- Unfinalise
  - This allows additional recording on a DVD-RW disc originally recorded on the HDD & DVD RECORDER.
  - A DVD-RW disc that has been recorded by DAO(Disc At Once) in a PC cannot be unfinalised.
  - A DVD-RW disc that has been recorded in Video Mode of a different maker's recorder cannot be unfinalised.
  - A DVD-R disc cannot be unfinalised.

Recording Formats

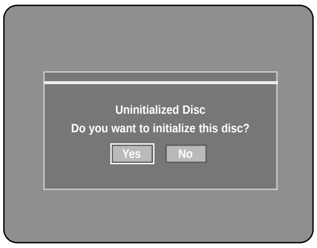
When you insert an unused disc, the following message appears. Since available functions differ depending on the disc type, select a disc that best fits your preferences.
DVD-RAM: Use after formatting the disc.



Unformatted Disc

Do you want to format this disc?

DVD-RW: When unused DVD-RW disc is first inserted, the message “Uninitialized Disc Do you want to initialize this disc?” will be displayed. If you select **Yes**, the disc will be formatted in VR mode.
If you want to change the mode, refer to Formatting a Disc on page 123.



Uninitialized Disc

Do you want to initialize this disc?

DVD-R: Formatting DVD is unnecessary and only Video Mode Recording is supported.

DVD-RW(V mode)/-R

- Chapters will be created automatically when you finalise recording on DVD-RW/-R discs in Video mode.
  The chapter’s length (interval between chapters) varies according to the recording mode.
- Simple editing (erasing titles/changing title name)

DVD-RAM/-RW(VR mode)

- This mode allows multiple editing functions (such as deletion of the whole title, partial deletion of a title, etc.)
- Various editing options using a created Playlist.

Recording Mode

Select one of four recording modes by pressing the **REC MODE** button repeatedly while the unit is in Stop mode for the desired recording time and picture quality. In general, picture quality improves as the recording time decreases. In FR mode, the most suitable record mode is adjusted automatically, according to remaining time on the disc and length of the timer recording. This function is selected only one mode in XP, SP, LP and EP modes and you can use this mode for timer recording.

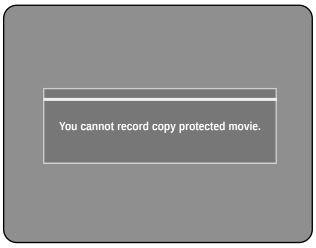
Recording Mode	Recording Times	
	HDD (160GB)	DVD-RAM/-RW/-R
XP (high quality mode)	Approx. 38 hours	Approx. 1 hour about 8.5 Mbps
SP (standard quality mode)	Approx. 72 hours	Approx. 2 hours about 4.5 Mbps
LP (long recording mode)	Approx. 138 hours	Approx. 4 hours about 2 Mbps
EP (extended mode)	Approx. 205 hours (At EP : 6 hours)	Approx. 6 hours/ about 1.6 Mbps
	Approx. 272 hours (At EP : 8 hours)	Approx. 8 hours/ about 1.2 Mbps
FR (Flexible Recording)	Approx. 38~205 hours	Approx.1~6 hours

NOTE

- Recording time may vary according to specific conditions.

Unrecordable pictures

Video with copy protection cannot be recorded on this HDD & DVD RECORDER.
When the HDD & DVD RECORDER receives a copy guard signal while recording, recording stops and the following message appears on the screen.



You cannot record copy protected movie.

Concerning Copy Control Signals

TV broadcasts that contain copy control signals may have one of the following three signal types, Copy-Free, Copy-Once and Copy-Never. If you want to record a copy-once type programme, use DVD-RW with CPRM in VR Mode and DVD-RAM.

Media \ Signal type	Copy-Free	Copy-Once	Copy-Never
DVD-RW(Ver.1.1)	O	-	-
DVD-RW(Ver.1.1) with CPRM			
VR mode	O	O*	-
V mode	O		-
DVD-R	O		-
DVD-RAM(Ver.2.0)	O	O*	-

* Once “Copy Once” has been recorded, recording cannot be done anymore.

- Content Protection for Recordable Media (CPRM)
CPRM is a mechanism that ties a recording to the media on which it is recorded. It is supported by some HDD & DVD RECORDERs, but not by many DVD players. Each blank recordable DVD has a unique 64-bit media ID etched in the BCA. When protected content is recorded onto the disc, it can be encrypted with a 56-bit C2 (Cryptomeria) cipher derived from the media ID.

During playback, the ID is read from the BCA and used to generate a key to decrypt the contents of the disc. If the contents of the disc are copied to other media, the ID will be absent or wrong and the data will not be decryptable.

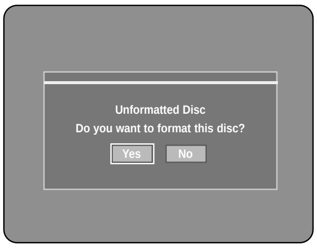
Recording the current TV programme you are watching

HDD DVD-RAM DVD-RW DVD-R

Check that the disc has enough available space for the recording. Adjust the recording mode.

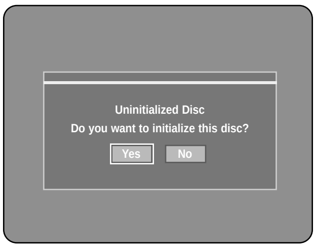
1 Press the **HDD** or **DVD** button.
If you select DVD, press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.
Press the **OPEN/CLOSE** button to close the disc tray.
Wait until **LOAD** disappears from the front panel display.

If an unused DVD-RAM disc is used, you will be prompted to format first. Make your selection using the ◄ ► buttons, then press **OK** button. (See page 77.)



Unformatted Disc
Do you want to format this disc?

If an unused DVD-RW disc is used, whether to initialize or not will be asked first. Make your selection, then press the **OK** button. (See page 77.)

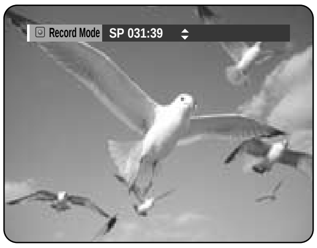


Uninitialized Disc
Do you want to initialize this disc?

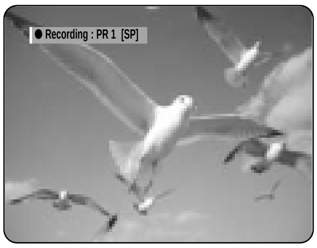
2 Press the **PROG (⌃ ⌄)** or number buttons to select the current programme you want to record.

3 Press the **REC MODE** button repeatedly, (or press the **REC MODE** button and then press the ▲▼ buttons) to select the recording speed(quality).

→ SP → LP → EP → XP



4 Press the **REC** button.
Information concerning the channel is displayed on the screen, then recording begins.
Icon(○) is displayed on the front panel.



- To pause recording -

- Press the **REC PAUSE** button to pause a recording in progress.
- Press the **REC PAUSE** button again during pause to resume recording.
- You can switch channels by pressing the **PROG (⌃ ⌄)** buttons while recording pauses.

- To stop recording -

Press the **STOP (⊡)** button to stop or finish a recording in progress.

- When using DVD-RAM/-RW/-R discs, the message “Updating the information of disc. Please wait for a moment” is displayed.

NOTE

- You cannot change the recording mode and the PROG while recording.
- Recording will stop automatically if there is no free space left for recording.
- Up to 99 titles can be recorded onto a disc (DVD-RAM/-RW/-R).
- Up to 999 titles can be registered on the HDD.
- HDD recording is available for up to 24 hours, and when recording for 24 hours, 4 titles will be recorded with each title has 6 hours in length.
- Recording will stop automatically if a copy protected image is selected.
- DVD-RAM/-RW discs must be formatted before starting to record. Most new discs are sold unformatted.
- Do not use DVD-R authoring discs with this unit.

Recording from external equipment you are watching

HDD DVD-RAM DVD-RW DVD-R

Before you start

Check whether the disc has enough available space for the recording. Adjust the recording mode.

1 Press the **HDD** or **DVD** button.
If you select DVD, Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray. Press the **OPEN/CLOSE** button to close the disc tray.
Wait until **LOAD** disappears from the front panel display.
If an unused DVD-RAM disc is used, whether to format or not will be asked first. (See page 77.)
If an unused DVD-RW disc is used, whether to initialize or not will be asked first. (See page 77.)

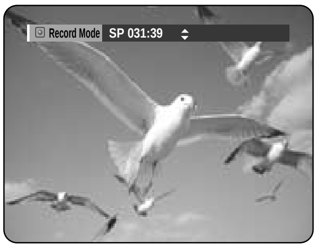
2 Press the **INPUT SEL.** button to select the input source according to the connection you made.
The front panel display changes in the following sequence:

→ PR Number → AV1 → AV2 → AV3 → DV

If you connect a digital camcorder, press the **INPUT SEL.** button to select **DV**. (See page 81.)

3 Press the **REC MODE** button repeatedly, (or press the **REC MODE** button, then press the ▲▼ buttons) to select the recording speed (quality).

→ SP → LP → EP → XP



4 Press the **REC** button.
Information concerning the external input mode is displayed on the screen, then recording begins.
Icon(◯) is displayed on the front panel.

- To pause recording -

- Press the **REC PAUSE** button to pause a recording in progress.
- Press the **REC PAUSE** button again during pause to resume recording.
- You can switch channels by pressing the **PROG (⌃ ⌄)** buttons while recording pauses.

- To stop recording -

Press the **STOP (⊡)** button to stop or finish a recording in progress.

- When using DVD-RAM/-RW/-R discs, the message “Updating the information of disc. Please wait for a moment” is displayed.

Copying from a Camcorder

You may control the Camcorder using the IEEE1394 (DV) interface.

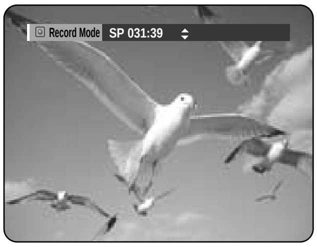
HDD DVD-RAM DVD-RW DVD-R

1 Connect the DV output jack of your camcorder to the DV input jack on the front of your HDD & DVD RECORDER using a DV cable.

2 Press the **HDD** or **DVD** button.
If you select DVD, Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray. Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display.

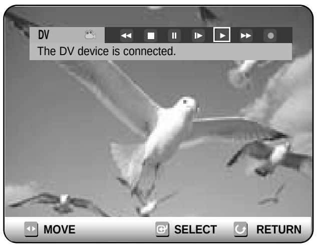
3 Press the **REC MODE** button repeatedly to select the recording speed(quality).

SP → LP → EP → XP



Record Mode SP 031:39

4 Press the **INPUT SEL.** button to select **DV**.
If the input is set to DV, a playback/record menu that enables camcorder control appears on the top of the screen.



DV

The DV device is connected.

5 Select the Play (▶) icon on the upper part of the screen to playback the camcorder and find the starting position to copy.
You can press the **PLAY (⏯)** button of the remote control to play the camcorder.

6 To start recording, use the ◀ ▶ buttons to select Record (●) icon in the top side of the screen, then press the **OK** button.
You can press the **REC** button of the remote control to start recording. To display playback related icons on the screen, press any direction button on the remote control.

- To stop recording -

Press the **STOP (⏹)** button to stop or finish a recording in progress.

- When using DVD-RAM/-RW/-R discs, the message “Updating the information of disc. Please wait for a moment” is displayed.

Making an One Touch Recording (OTR)

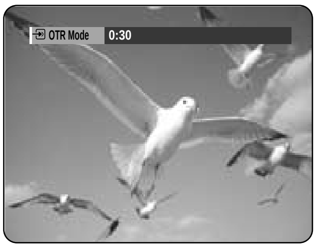
You can set the HDD & DVD RECORDER to record in 30-minute increments up to 8 hours by pressing the **REC** button.

HDD DVD-RAM DVD-RW DVD-R

1 Press the **HDD** or **DVD** button.
If you select DVD, press the **OPEN/CLOSE** button and place a recordable disc on the disc tray. Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display.

2 Press the **PROG (⌃ ⌄)** or number buttons to select the programme to record. If you want to record through a connected external component, press the **INPUT SEL.** button to select an appropriate external input (AV1, AV2, AV3, DV or PR Number).

3 Press the **REC** button to start recording.



4 Press the **REC** button repeatedly to adjust the desired recording time.

0:30 → 1:00 → ... 8:00 → Off

NOTE

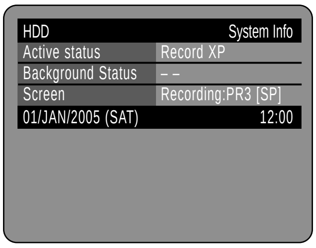
- The timer counter decreases by the minute from 8:00 to 0:00, then the HDD & DVD RECORDER will stop recording.

- To stop recording -

Press the **STOP (⊡)** button. The message “Do you want to stop recording?” is displayed.
- Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
- Or press the **STOP (⊡)** button again.

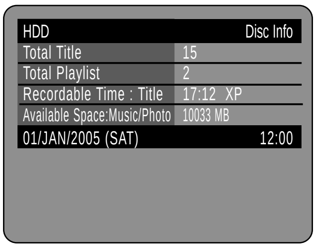
About DISPLAY button

During recording, press the **DISPLAY** button once. The system information screen appears : Displays Active Status, Background Status and Main Screen information.



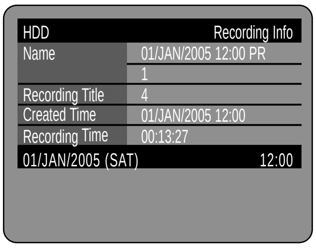
HDD	System Info
Active status	Record XP
Background Status	– –
Screen	Recording:PR3 [SP]
01/JAN/2005 (SAT)	12:00

During recording, press the **DISPLAY** button twice. Disc information screen appears : Displays Total numbers of Titles and Playlists, Recordable Time(Title) and Available Space(Music/Photo).



HDD	Disc Info
Total Title	15
Total Playlist	2
Recordable Time : Title	17:12 XP
Available Space:Music/Photo	10033 MB
01/JAN/2005 (SAT)	12:00

During recording, press the **DISPLAY** button thrice. Current recording information screen appears : Displays information of recording Name, Title, Created Time and Recording Time.



HDD	Recording Info
Name	01/JAN/2005 12:00 PR 1
Recording Title	4
Created Time	01/JAN/2005 12:00
Recording Time	00:13:27
01/JAN/2005 (SAT)	12:00

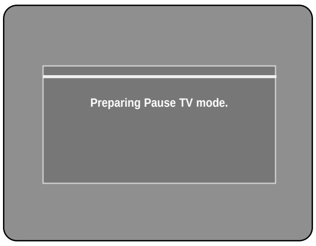
Watching the Images Being Recorded (Time Slip)

This function allows you to watch the recently recorded images on the screen while a recording is in progress, with a 10 second delay.

HDD

In Stop mode

1 Press the **TIME SLIP** button to start recording.
- The message “Preparing Pause TV mode.” is displayed for 10 seconds, and the screen pauses on the first frame of the title that is being played back.



Preparing Pause TV mode.

- If paused for 5 minutes without any operation, it returns to normal playback mode.
- You can use playback related buttons to go to the desire scene.
- Forward Scan operation on a title that you are currently recording will switch to normal playback automatically when it reaches 10 seconds ahead of the current recording position.

2 Press the **REC** button repeatedly to set the OTR. (One Touch Record)
- Record length 0:30 appears on the On-Screen Display and the DVD Recorder will record for exactly 30 minutes.

3 Press the **STOP (■)** button once, the Time Slip function disappear.

4 Press the **STOP (■)** button twice to stop recording.

In Record mode

1 Press the **REC** button.
Wait 10 seconds and press the **TIME SLIP** button. The recently recorded image are played back on the screen with a 10 second delay.
- You can use playback related buttons to go to the desire scene.
- Forward Scan operation on a title that you are currently recording will automatically switch to normal playback when it reaches 10 seconds ahead of the current recording position.

2 Press the **REC** button repeatedly to set the OTR. (One Touch Record)
- Record length 0:30 appears on the On-Screen Display and the DVD Recorder will record for exactly 30 minutes.

3 Press the **STOP (■)** button once, the Time Slip function disappear.

4 Press the **STOP (■)** button twice to stop recording.

NOTE

- ■ During a timer recording, Time Slip function does not operates.
- ■ During Chase Play Mode, when stopping the recording due to disc full/copy protect, playback/recording are stopped, and it saves the title being recorded.

Chasing Play

You can play back from the beginning of the programme you are recording.

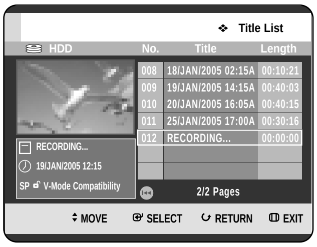
HDD

While Recording

1 Press the **PLAY ( )** button.
It plays back the title that you are currently recording from the beginning.
Playback is not available for 10 seconds from the start of recording.
You can use the **SKIP ( )** and other playback-related buttons to view the previous recorded list.

Using the TITLE LIST button

1 With the unit in recording mode, press the **TITLE LIST** button.
The Title List screen is displayed.
Press the **▲▼/SKIP ( )** buttons to select the recording title list.



No.	Title	Length
008	18/JAN/2005 02:15A	00:10:21
009	19/JAN/2005 14:15A	00:40:03
010	20/JAN/2005 16:05A	00:40:15
011	25/JAN/2005 17:00A	00:30:16
012	RECORDING...	00:00:00

RECORDING...
19/JAN/2005 12:15
SP V-Mode Compatibility

2 Press the **OK** or **PLAY ( )** button.
It plays back the title that you are currently recording from the beginning.

- Stopping Playback / Recording -

1 Press the **STOP ( )** button. Playback screen disappears and the recording in progress screen appears.

2 Press the **STOP ( )** button again to stop recording.

NOTE

- No sound is heard during search mode.
- DVD disc playback is available during HDD recording. However, JPEG, MP3, and DivX files in the disc cannot be played back.
- An audio CD (CD-DA) is also not available during HDD recording.
- HDD playback is available during DVD recording. However, JPEG and MP3 files in the HDD cannot be played back.

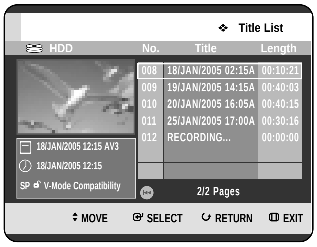
Simultaneous Recording and Playback

You can watch the previous title list while recording a programme.

HDD

Using the TITLE LIST button

1 With the unit in recording mode, press the **TITLE LIST** button.
The Title List screen is displayed.



Title List

HDD

No.	Title	Length
008	18/JAN/2005 02:15A	00:10:21
009	19/JAN/2005 14:15A	00:40:03
010	20/JAN/2005 16:05A	00:40:15
011	25/JAN/2005 17:00A	00:30:16
012	RECORDING...	00:00:00

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility

2/2 Pages

2 Press the ▲▼/ **SKIP (⏮ ⏭)** buttons to select the title, then press the **OK** or **PLAY (⏯)** button.
Selected title list start to playback.

- Stopping Playback / Recording -

1 Press the **STOP (■)** button. Playback screen disappears and the recording in progress screen appears.

2 Press the **STOP (■)** button again to stop recording.

NOTE

- No sound is heard during search mode.

Making a Timer Recording

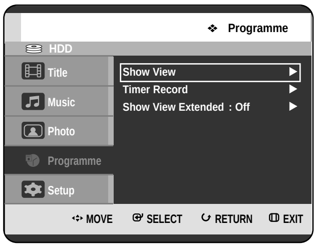
HDD DVD-RAM DVD-RW DVD-R

1. Check the antenna cable is connected.
2. Check the remaining time of the disc.
3. Check the date and time are correct.

Make sure the Clock (Setup-Clock Set) must be set before you proceed with a timer recording. (See page 27.)

Using the TIMER button

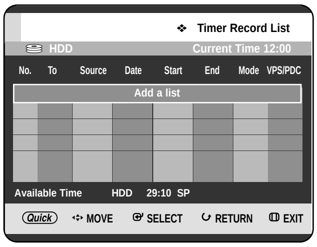
1 With the unit in Stop mode/Playback mode, press the **TIMER** button.
The Programme screen is displayed.


Programme
HDD
Title
Music
Photo
Programme
Setup
Show View ▶
Timer Record ▶
Show View Extended : Off ▶
MOVE
SELECT
RETURN
EXIT

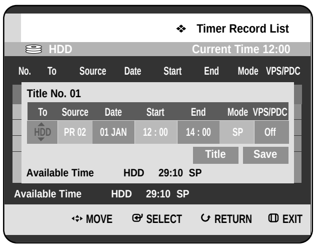
Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Programme**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select **Timer Record**, then press the **OK** or ▶ button.
The Timer Record List screen is displayed.


Timer Record List
HDD
Current Time 12:00
No.
To
Source
Date
Start
End
Mode
VPS/PDC
Add a list
Available Time HDD 29:10 SP
Quick
MOVE
SELECT
RETURN
EXIT

3 Press the **OK** button to select **Add a list**.
The Timer Record Input item is displayed.


Timer Record List
HDD
Current Time 12:00
No.
To
Source
Date
Start
End
Mode
VPS/PDC
Title
Save
MOVE
SELECT
RETURN
EXIT

Title No. 01

To	Source	Date	Start	End	Mode	VPS/PDC
HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	Off

Available Time HDD 29:10 SP

Available Time HDD 29:10 SP

Using the QUICK button.

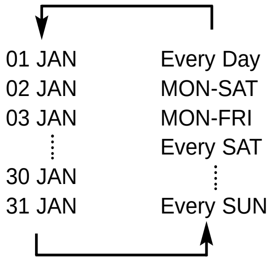
- Press the **QUICK** button.
- Press the ▲▼ buttons to select **Add**, then press the **OK** or ▶ button.

4 Set timer recording option.

- Fill the input items using the ▲▼◀ ▶ buttons and number buttons.

◀ ▶ : Moves to the previous/next item.
▲▼ **0~9** : Sets a value.

- **To** : Select the media to record HDD or DVD.
- **Source** : The video input source (AV1, AV2 or AV3), or the broadcasting channel you want to make a timer recording from.
- **Date** : Timer Recording allows setting the recording time within one month period. Set the recording day. (day/month)


01 JAN
02 JAN
03 JAN
30 JAN
31 JAN
Every Day
MON-SAT
MON-FRI
Every SAT
Every SUN

- **Start/End Time** : Start and end time of the timer recording.
- **Mode (Recording Mode) :**

- FR (Flexible Recording) : Select when you want to set video quality automatically. In FR mode, the most suitable record mode is adjusted automatically, according to remaining time on the disc and length of the timer recording. This function is selected only one mode in XP, SP, LP and EP modes.
- XP (high quality) : Select when video quality is important.
- SP (standard quality) : Select to record in standard quality.
- LP (low quality) : Select when a long recording time is required.
- EP (extended) : Select when a longer recording time is required.

NOTE

- When you are recording at EP mode on a DVD-RW(V mode)/-R disc, it may not record the full 6 or 8 hours because the unit uses the VBR(Variable Bit Rate) ENCODING system. For example, if you record a programme with a lot of action, it uses a higher bit rate which in turn consumes more disc memory.

• **VPS/PDC** : VPS(Video Programme System) or PDC(Programme Delivery Control) function.

- If you set this function on, you can control the starting and ending time of recording by special signal included in the broadcasting signal. If a TV programme is shortened or starts earlier or later than scheduled, this function synchronizes the starting and ending time of recording with the actual broadcasting time automatically.
- Set up the start-time EXACTLY according to the published TV schedule. Otherwise the timer recording will not operate.
- Do not select PDC or VPS unless you are sure the programme you wish to record is broadcast with PDC or VPS.

• **TITLE** : To label the title name, select the title and then press the **OK** button. Title renaming screen appears. See page 96 for the registration.

5 After selecting the set up value for each mode, press the **OK** button to select **Save**, and press the **OK** button again.

• ◷ will appear on the front panel. It means that a timer recording is registered.

To exit without saving the current setting
Press the **MENU** button.

To return to the previous menu
Press the **RETURN** button if you don’t want to set a timer recording.

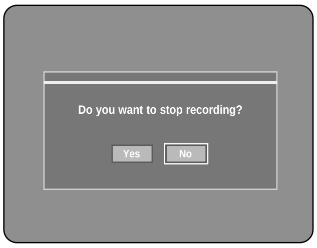
If the timer settings overlap;
The programmes are recorded in order of priority. If timer recording is set for the first programme and then again for the second programme and both programmes overlap, the following message will appear on the screen: “This setting is identical with 1.” The message shows that the first programme has priority. After recording of the first programme is completed, the second programme starts recording.

6 When you want to recording on DVD-RAM/-RW/-R, you must insert the disc.

7 Press the **ON/STANDBY** button to go to standby mode to activate the timer recording setting.
Timer Recording will not work when the power is on.

- Stop Timer Recording when activated -

1 Press the **STOP (⊙)** button to stop timer recording.



Do you want to stop recording?

2 Press the ▲▼ buttons to select **Yes**, then press the **OK** button.
The recording will stop.

• Refer to pages 89~90 to delete a timer record list before the time recording starts.

NOTE

- During power on mode and the start time of the timer recording is reached, the ◷ will blink. Press the **ON/STANDBY** button to go to standby mode to activate timer recording. It will take around 1/2 minutes before the recording starts.
- The timer recording time may differ from the set time depending on disc status and overall timer recording status (for example, recording times overlapping, or when the previous recording ends within 2 minutes before the start time of the next recording.)
- You can make the Timer Recording up to 12 programmes.
- If HDD disk has no available recording space, ◷ blinks. It means that HDD disk has no space to record.
- During the Timer Recording, TIME SLIP function is not operated.

Flexible Recording (for Timer recording only)

HDD DVD-RAM DVD-RW DVD-R

In FR mode, the most suitable record mode is adjusted automatically, according to remaining time on the disc and length of the timer recording. This function is selected only one mode in XP, SP, LP and EP modes and you can use this mode for timer recording.

The FR mode recording setup is the same as Timer Recording. When setting the mode in step 4, set to FR mode (See page 87.)

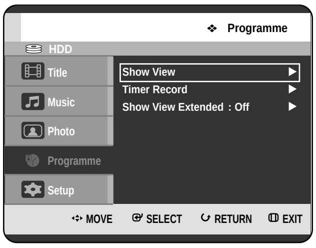
Editing the Timer Record List

Follow these directions to edit the timer record list.

HDD DVD-RAM DVD-RW DVD-R

Using the TIMER button

1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Programme screen is displayed.

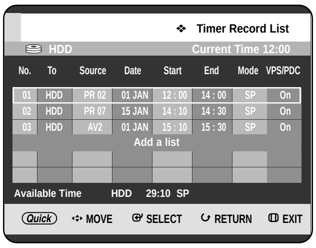

Programme
HDD
Title
Music
Photo
Programme
Setup
Show View
Timer Record
MOVE
SELECT
RETURN
EXIT

Show View Extended : Off

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Programme**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select **Timer Record**, then press the **OK** or ▶ button.


Timer Record List
HDD
Add a list
Quick
MOVE
SELECT
RETURN
EXIT

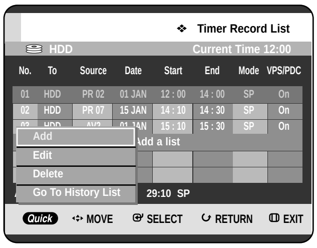
Current Time 12:00

No.	To	Source	Date	Start	End	Mode	VPS/PDC
01	HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	On
02	HDD	PR 07	15 JAN	14 : 10	14 : 30	SP	On
03	HDD	AV2	01 JAN	15 : 10	15 : 30	SP	On

Available Time HDD 29:10 SP

3 Press the ▲▼ buttons to select the number of the Timer Record List you want to edit, then press the **QUICK** button.

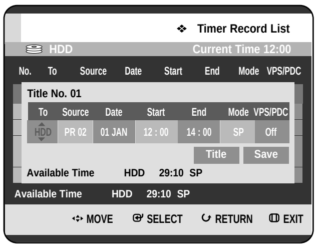
- The **Add**, **Edit**, **Delete** and **Go To History List** items is displayed.


❖ Timer Record List
HDD
Current Time 12:00
Add
Edit
Delete
Go To History List
Add a list
29:10 SP
Quick
MOVE
SELECT
RETURN
EXIT

No.	To	Source	Date	Start	End	Mode	VPS/PDC
01	HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	On
02	HDD	PR 07	15 JAN	14 : 10	14 : 30	SP	On
				15 : 10	15 : 30	SP	On

4 Press the ▲▼ buttons to select **Edit**, then press the **OK** or ▶ button.

- The Timer Record Input item is displayed. Edit the items you want to modify. See the “Making a Timer Recording” section for more information on Timer Recording Input items.(See page 86.)


❖ Timer Record List
HDD
Current Time 12:00
No. To Source Date Start End Mode VPS/PDC
Title
Save
MOVE
SELECT
RETURN
EXIT

Title No. 01

To	Source	Date	Start	End	Mode	VPS/PDC
HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	Off

Available Time HDD 29:10 SP

Available Time HDD 29:10 SP

5 Press the **OK** button to select **Save**, then press the **OK** button to confirm the edited setting.

6 Press the **MENU** button after finishing the operation. The Timer Record List screen will disappear.

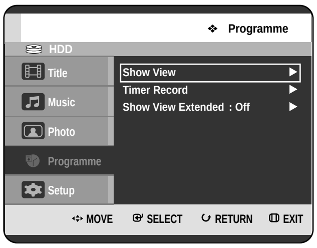
Deleting a Timer Record List

Follow these directions to delete an entry from the timer record list.

HDD DVD-RAM DVD-RW DVD-R

Using the TIMER button

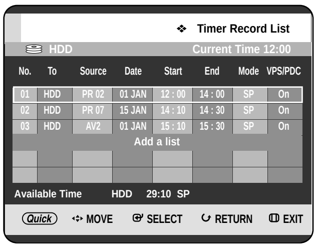
1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Programme screen is displayed.


❖ Programme
HDD
Title
Music
Photo
Programme
Setup
Show View ▶
Timer Record ▶
Show View Extended : Off ▶
MOVE
SELECT
RETURN
EXIT

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Programme**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select **Timer Record**, then press the **OK** or ▶ button. The Timer Record List screen is displayed.

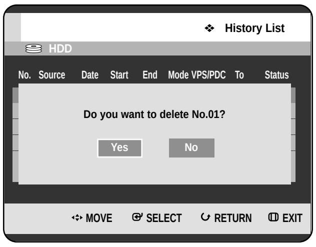

❖ Timer Record List
HDD
Current Time 12:00
Add a list
Quick
MOVE
SELECT
RETURN
EXIT

No.	To	Source	Date	Start	End	Mode	VPS/PDC
01	HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	On
02	HDD	PR 07	15 JAN	14 : 10	14 : 30	SP	On
03	HDD	AV2	01 JAN	15 : 10	15 : 30	SP	On

Available Time HDD 29:10 SP

6 Press the ▲▼ buttons to select **Delete**, then press the **OK** or ▶ button.

- You will be prompted with the delete confirm message such as "Do you want to delete No.01?".


History List
HDD
No. Source Date Start End Mode VPS/PDC To Status
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete No.01?

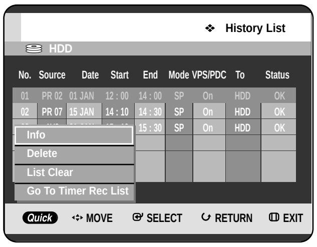
7 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.

- The selected History List is deleted.

Clear History List

Clears all History Lists at once.

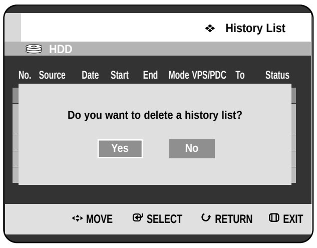
5-1 Press the **QUICK** button.


History List
HDD
Info
Delete
List Clear
Go To Timer Rec List
Quick
MOVE
SELECT
RETURN
EXIT

No.	Source	Date	Start	End	Mode	VPS/PDC	To	Status
01	PR 02	01 JAN	12 : 00	14 : 00	SP	On	HDD	OK
02	PR 07	15 JAN	14 : 10	14 : 30	SP	On	HDD	OK
				15 : 30	SP	On	HDD	OK

6 Press the ▲▼ buttons to select **List Clear**, then press the **OK** or ▶ button.

- You will be prompted with the delete confirm message "Do you want to delete a history list?".


History List
HDD
No. Source Date Start End Mode VPS/PDC To Status
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete a history list?

7 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.

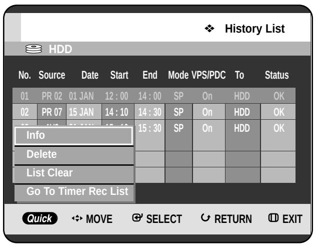
- All History Lists are deleted.
- A message "No history list is found" is displayed.

Press the **OK** button.

Go To Timer Rec List

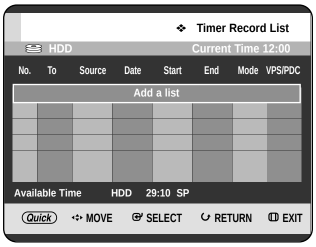
Switches directly from the History List to the Timer Rec List.

5-1 Press the **QUICK** button.


History List
HDD
Info
Delete
List Clear
Go To Timer Rec List
Quick
MOVE
SELECT
RETURN
EXIT

No.	Source	Date	Start	End	Mode	VPS/PDC	To	Status
01	PR 02	01 JAN	12 : 00	14 : 00	SP	On	HDD	OK
02	PR 07	15 JAN	14 : 10	14 : 30	SP	On	HDD	OK
				15 : 30	SP	On	HDD	OK

6 Press the ▲▼ buttons to select **Go To Timer Rec List**, then press the **OK** or ▶ button.


Timer Record List
HDD
Current Time 12:00
No. To Source Date Start End Mode VPS/PDC
Add a list
Quick
MOVE
SELECT
RETURN
EXIT

Available Time HDD 29:10 SP

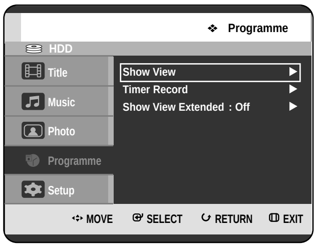
Using the ShowView Feature

Before presetting your HDD & DVD RECORDER:
- Switch on both the television and your HDD & DVD RECORDER.
- Check that the date and time are correct.

Up to twelve programmes can be preset.

Using the TIMER button

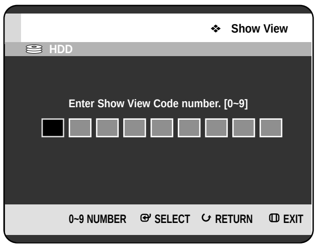
1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Programme screen is displayed.


Programme
HDD
Title
Music
Photo
Programme
Setup
Show View ▶
Timer Record ▶
Show View Extended : Off ▶
MOVE
SELECT
RETURN
EXIT

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Programme**, then press the **OK** or ▶ button.

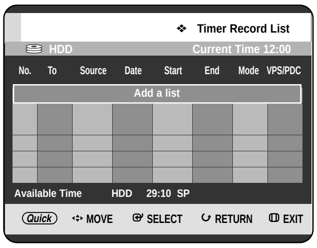
2 Press the ▲▼ buttons to select **Show View**, then press the **OK** or ▶ button.
- A message is displayed to allow you to enter the ShowView code.

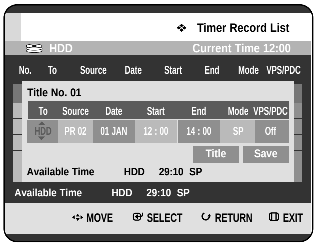

Show View
HDD
0~9 NUMBER
SELECT
RETURN
EXIT

Enter Show View Code number. [0~9]

3 Press the number buttons to enter the code of the programme that you want to record in your television magazine.
- If you want to correct the ShowView code that you are entering:
- Press the ◀ button to clear the digit.
- Enter the correct digit.

4 Press **OK** button to make code.
- The information concerning the programme is displayed.
- When using the ShowView function for the first time with stored stations, you must enter the PR number manually by pressing the ▲▼ buttons or number buttons.


Timer Record List
HDD
Current Time 12:00
No. To Source Date Start End Mode VPS/PDC
Add a list
Available Time HDD 29:10 SP
Quick
MOVE
SELECT
RETURN
EXIT


Timer Record List
HDD
Current Time 12:00
No. To Source Date Start End Mode VPS/PDC
Title
Save
MOVE
SELECT
RETURN
EXIT

Title No. 01

To	Source	Date	Start	End	Mode	VPS/PDC
HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	Off

Available Time HDD 29:10 SP

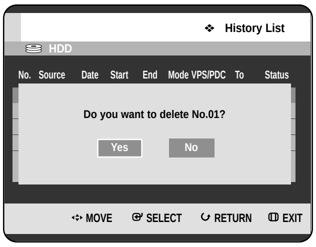
Available Time HDD 29:10 SP

5 If the programme and times are correct, press the **OK** button.
Press the **OK** button to confirm the setting.

6 Press the **ON/STANDBY** button to go to standby mode to activate the timer recording setting.

7 Refer to pages 88~90 if you wish to:
- Check whether the timer Recording has set correctly or not.
- Cancel a preset recording

6 Press the ▲▼ buttons to select **Delete**, then press the **OK** or ▶ button.
- You will be prompted with the delete confirm message such as “Do you want to delete No.01?”.


History List
HDD
No. Source Date Start End Mode VPS/PDC To Status
Yes
No
MOVE
SELECT
RETURN
EXIT

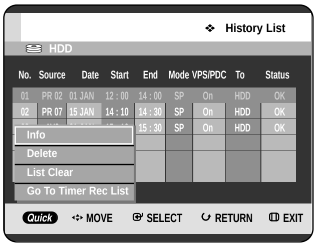
Do you want to delete No.01?

7 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
- The selected History List is deleted.

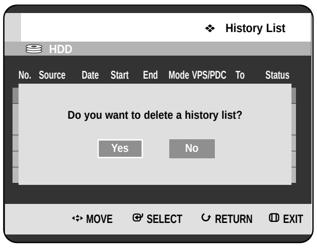
Clear History List

Clears all History Lists at once.

5-1 Press the **QUICK** button.


History List
HDD
No. Source Date Start End Mode VPS/PDC To Status
01 PR 02 01 JAN 12 : 00 14 : 00 SP On HDD OK
02 PR 07 15 JAN 14 : 10 14 : 30 SP On HDD OK
15 : 30 SP On HDD OK
Info
Delete
List Clear
Go To Timer Rec List
Quick
MOVE
SELECT
RETURN
EXIT

6 Press the ▲▼ buttons to select **List Clear**, then press the **OK** or ▶ button.
- You will be prompted with the delete confirm message “Do you want to delete a history list?”.


History List
HDD
No. Source Date Start End Mode VPS/PDC To Status
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete a history list?

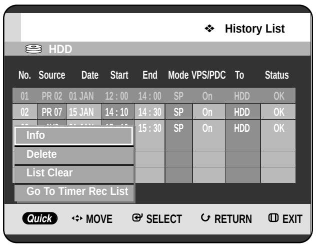
7 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
- All History Lists are deleted.
- A message “No history list is found” is displayed.

Press the **OK** button.

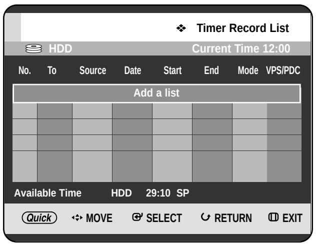
Go To Timer Rec List

Switches directly from the History List to the Timer Rec List.

5-1 Press the **QUICK** button.


History List
HDD
No. Source Date Start End Mode VPS/PDC To Status
01 PR 02 01 JAN 12 : 00 14 : 00 SP On HDD OK
02 PR 07 15 JAN 14 : 10 14 : 30 SP On HDD OK
15 : 30 SP On HDD OK
Info
Delete
List Clear
Go To Timer Rec List
Quick
MOVE
SELECT
RETURN
EXIT

6 Press the ▲▼ buttons to select **Go To Timer Rec List**, then press the **OK** or ▶ button.


Timer Record List
HDD
Current Time 12:00
No. To Source Date Start End Mode VPS/PDC
Add a list
Available Time HDD 29:10 SP
Quick
MOVE
SELECT
RETURN
EXIT

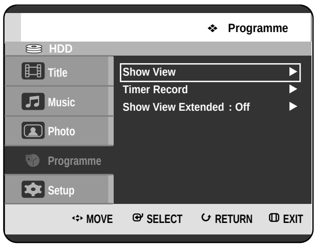
Using the ShowView Feature

Before presetting your HDD & DVD RECORDER:
- Switch on both the television and your HDD & DVD RECORDER.
- Check that the date and time are correct.

Up to twelve programmes can be preset.

Using the TIMER button

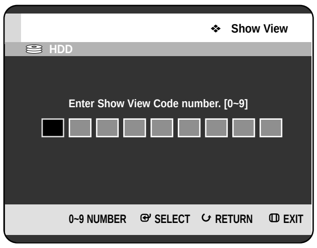
1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Programme screen is displayed.


Programme
HDD
Title
Music
Photo
Programme
Setup
Show View
Timer Record
Show View Extended : Off
MOVE
SELECT
RETURN
EXIT

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Programme**, then press the **OK** or ▶ button.

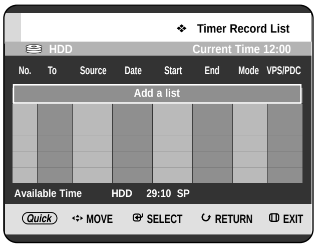
2 Press the ▲▼ buttons to select **Show View**, then press the **OK** or ▶ button.
- A message is displayed to allow you to enter the ShowView code.


Show View
HDD
0~9 NUMBER
SELECT
RETURN
EXIT

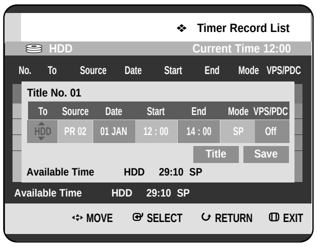
Enter Show View Code number. [0~9]

3 Press the number buttons to enter the code of the programme that you want to record in your television magazine.
- If you want to correct the ShowView code that you are entering:
- Press the ◀ button to clear the digit.
- Enter the correct digit.

4 Press **OK** button to make code.
- The information concerning the programme is displayed.
- When using the ShowView function for the first time with stored stations, you must enter the PR number manually by pressing the ▲▼ buttons or number buttons.


Timer Record List
HDD
Current Time 12:00
No.
To
Source
Date
Start
End
Mode
VPS/PDC
Add a list
Quick
MOVE
SELECT
RETURN
EXIT

Available Time HDD 29:10 SP


Timer Record List
HDD
Current Time 12:00
No.
To
Source
Date
Start
End
Mode
VPS/PDC
Title
Save
MOVE
SELECT
RETURN
EXIT

Title No. 01

To	Source	Date	Start	End	Mode	VPS/PDC
HDD	PR 02	01 JAN	12 : 00	14 : 00	SP	Off

Available Time HDD 29:10 SP

Available Time HDD 29:10 SP

5 If the programme and times are correct, press the **OK** button.
Press the **OK** button to confirm the setting.

6 Press the **ON/STANDBY** button to go to standby mode to activate the timer recording setting.

7 Refer to pages 88~90 if you wish to:
- Check whether the timer Recording has set correctly or not.
- Cancel a preset recording

NOTE

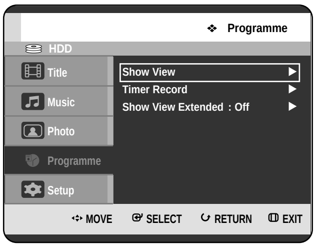
- The numbers next to each TV programme listing in the magazines or newspapers are ShowView code numbers, which allow you to programme your HDD & DVD RECORDER instantly with the remote control. Enter the ShowView code for the programme you wish to record.
- ShowView is a trademark of Gemstar Development Corporation. The ShowView system is manufactured under licence from Gemstar Development Corporation.

ShowView Extended

To prevent delays or overruns, HDD & DVD RECORDER has a function called ShowView Extened allowing you to extend the recording time by up to 60 minutes.

Using the TIMER button

1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Programme screen is displayed.

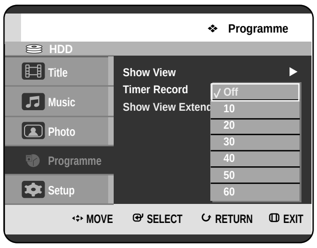

Programme
HDD
Title
Music
Photo
Programme
Setup
Show View
Timer Record
MOVE
SELECT
RETURN
EXIT

Show View Extended : Off

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Programme**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select **Show View Extended**, then press the **OK** or ▶ button.


Programme
HDD
Title
Music
Photo
Programme
Setup
Show View
Timer Record
Show View Extend
√ Off
10
20
30
40
50
60
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the ShowView Extended time, then the press **OK** or ▶ button.

4 Press the **MENU** button to exit the menu.

Editing

This section introduces basic functions of editing and explains both edit functions for the recording on a disc and edit functions for the entire disc.

Basic Editing (Title List) 96

Advanced Editing (Playlist) 103

Copying from HDD to DVD 111

Copying Multiple Titles at One Time 114

Copying from DVD to HDD 118

Copying MP3 or JPEG Files from a Disc to HDD . . .119

Disc Manager 121

- **Title List**
  A title is a section of recorded video and audio.
  Title List shows a list to help you select a title.
  Since the title consists of the information on stream that is actually recorded, if one title is deleted, that title cannot be played again.
- **Play List**
  This refers to a unit of playback, which is made by selecting a desired scene in the entire Title List.
  When one playlist is played, only the scene selected by the user will play and then stop. Since only the information necessary for playing a desired scene is included in a playlist, even if that playlist is deleted, the original stream will not be deleted.

Recording or editing might not be completed if an error, such as a sudden power failure occurs. Please be aware that a material that has been damaged is unable to be retrieved to its original content.

Basic Editing (Title List)

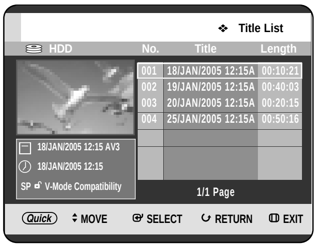
Renaming(Labeling) a Title

Follow these instructions to rename a title list entry, i.e., to edit the title of a recorded programme.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
Quick
MOVE
SELECT
RETURN
EXIT

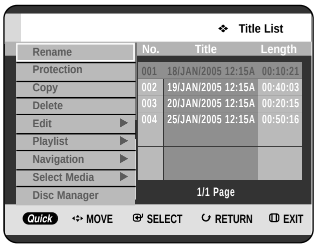
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

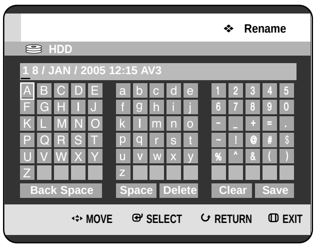
2 Press the ▲▼ buttons to select an entry you want to rename from the Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

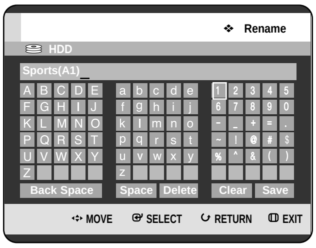
1/1 Page

3 Press the ▲▼ buttons to select **Rename**, then press the **OK** or ▶ button.
The Rename screen is displayed.


Rename
HDD
A B C D E a b c d e 1 2 3 4 5
F G H I J f g h i j 6 7 8 9 0
K L M N O k l m n o - _ + = .
P Q R S T p q r s t ~ ! @ # $
U V W X Y u v w x y % ^ & ( )
Z z
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

1 8 / JAN / 2005 12:15 AV3

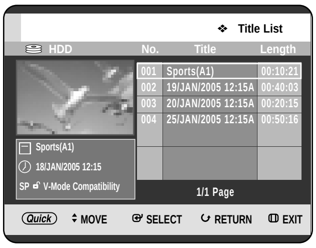
4 Select the desired characters using the ▲▼ ◀ ▶ buttons, press the **OK** button.


Rename
HDD
A B C D E a b c d e 1 2 3 4 5
F G H I J f g h i j 6 7 8 9 0
K L M N O k l m n o - _ + = .
P Q R S T p q r s t ~ ! @ # $
U V W X Y u v w x y % ^ & ( )
Z z
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

Sports(A1)_

- **Back Space:** Deletes and moves the cursor backwards by one position. (Equivalent to the **CANCEL** button)
- **Space:** Enters a blank and moves the cursor one forward (to the right).
- **Delete:** Deletes the character at the cursor position.
- **Clear:** Deletes all the character inputs.
- **Save:** Registers the character inputs.

5 Press the ▲▼ ◀ ▶ buttons to select **Save**, and then press the **OK** button.
The changed title name is displayed on the title item of the selected entry.


Title List
HDD
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	Sports(A1)	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Sports(A1)
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page

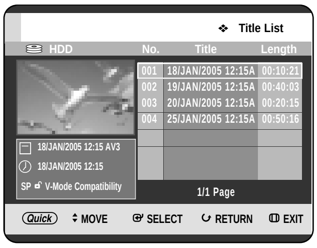
Locking (Protecting) a Title

Follow these instructions to lock an entry to protect it from accidental deletion.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button .
The Title List screen is displayed.


Title List
HDD
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

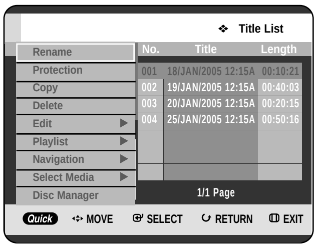
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility

Using the MENU button.

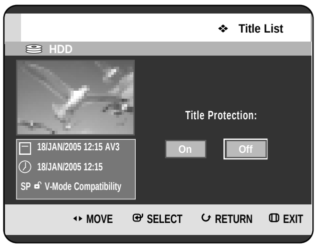
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

2 Press the ▲▼ buttons to select an entry you want to protect from the Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

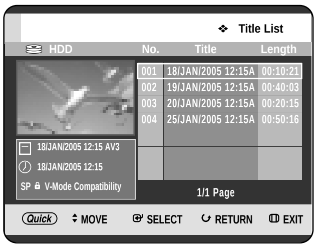
3 Press the ▲▼ buttons to select **Protection**, then press the **OK** or ▶ button.


Title List
HDD
On
Off
MOVE
SELECT
RETURN
EXIT

Title Protection:

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility

4 Press the ◀ ▶ buttons to select **On**, then press the **OK** button. The key icon on the information window for the selected entry changes to the locked status. (🔓→🔒)


Title List
HDD
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP 🔒 V-Mode Compatibility

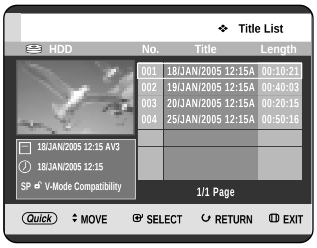
Deleting a Title

Follow these instructions to delete an entry from the Title List.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.

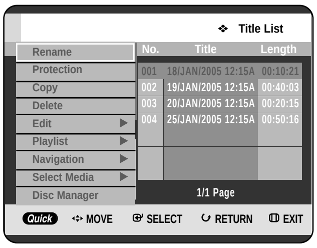

Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
Quick MOVE SELECT RETURN EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

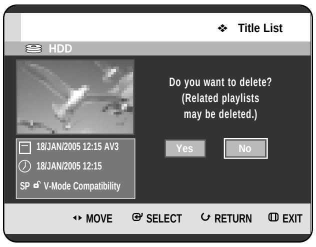
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

2 Press the ▲▼ buttons to select an entry you want to delete in the Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
1/1 Page
Quick MOVE SELECT RETURN EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

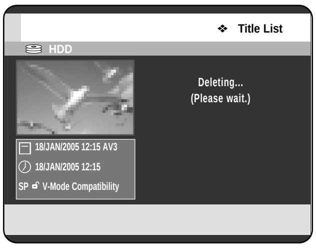
3 Press the ▲▼ buttons to select **Delete**, then press the **OK** or ▶ button.


Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
Yes
No
MOVE SELECT RETURN EXIT

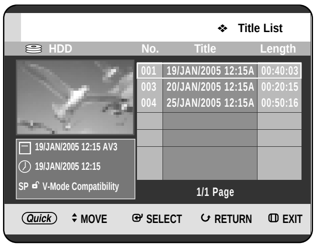
Do you want to delete?
(Related playlists
may be deleted.)

- The message may be different depend on the type of disc. You will be prompted with the confirmation message. HDD, DVD-RAM(VR mode), DVD-RW(VR mode): Since Playlist is present, the message “Do you want to delete? (Related playlists may be deleted.)” is displayed. DVD-RW(Video mode)/-R: Since Playlist is not present, the message “Do you want to delete?” is displayed.

4 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.


Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility

Deleting...
(Please wait.)


Title List
HDD
19/JAN/2005 12:15 AV3
19/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
Quick MOVE SELECT RETURN EXIT

No.	Title	Length
001	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

NOTE

- You cannot delete a protected entry. If you want to delete a protected entry, select “Off” in the Title Protection menu.
  (See page 97.)
- When the Disc Protection has been set to Protected, you cannot delete titles.
  (See page 122.)
- Once an entry is deleted from the Title List, it cannot be recovered.
- Once DVD-RW/-R is finalised, it cannot be deleted.

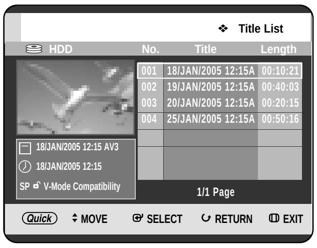
Splitting a Section of a Title (Split)

Follow these instructions to split a section of a Title List entry.

HDD

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
Quick
MOVE
SELECT
RETURN
EXIT

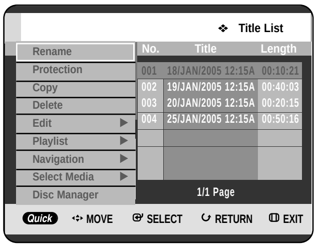
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

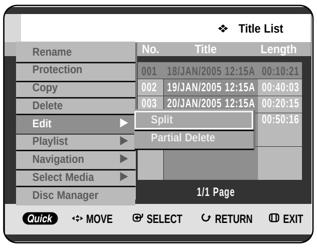
2 Press the ▲▼ buttons to select an entry you want to Split from the Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

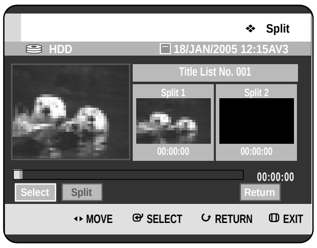
1/1 Page

3 Press the ▲▼ buttons to select **Edit**, then press the **OK** or ▶ button.
The Edit menu is displayed

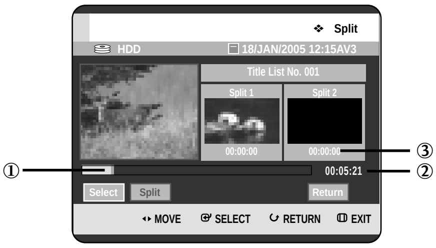

❖ Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Split
Partial Delete
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
		00:50:16

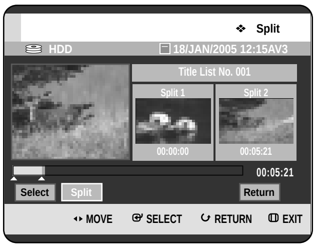
4 Press the ▲▼ buttons to select **Split**, then press the **OK** or ▶ button.


❖ Split
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Split 1
Split 2
00:00:00
00:00:00
00:00:00
Select
Split
Return
MOVE
SELECT
RETURN
EXIT

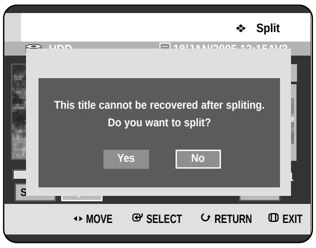
5 Using the playback-related buttons (**PLAY(**⏯**)**, **SEARCH (**⏪ ⏩**)**), move to a point for splitting and press the **OK** button.
If it is not the point where you want to split, press the **RETURN** button to cancel the selection. Using the playback-related buttons, move to a point to split and press the **OK** button.


❖ Split
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Split 1
Split 2
00:00:00
00:00:00
00:05:21
Select
Split
Return
MOVE
SELECT
RETURN
EXIT
①
②
③

① First split interval
② Current playtime
③ Start time of the second split and its screen

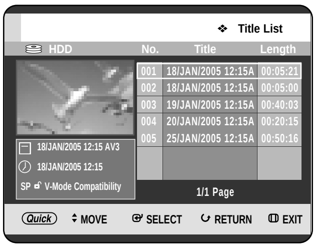

❖ Split
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Split 1
Split 2
00:00:00
00:05:21
00:05:21
Select
Split
Return
MOVE
SELECT
RETURN
EXIT

6 Press the **OK** button to select **Split**.
The message “This title cannot be recovered after spliting. Do you want to split?” is displayed.


❖ Split
Yes
No
MOVE
SELECT
RETURN
EXIT

This title cannot be recovered after spliting.
Do you want to split?

7 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
The split title is divided into two, and next title will be pushed back one by one.


❖ Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:05:21
002	18/JAN/2005 12:15A	00:05:00
003	19/JAN/2005 12:15A	00:40:03
004	20/JAN/2005 12:15A	00:20:15
005	25/JAN/2005 12:15A	00:50:16

Deleting a Section of a Title (Partial Delete)

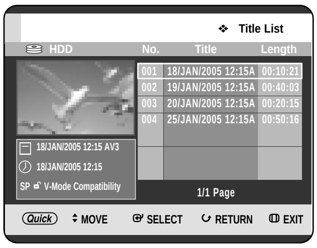
Follow these instructions to delete a section of a Title List entry.

HDD DVD-RAM DVD-RW

(VR mode)

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.

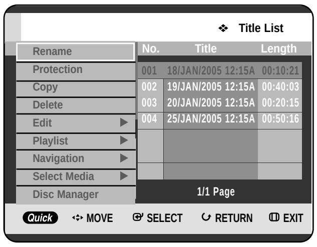

Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

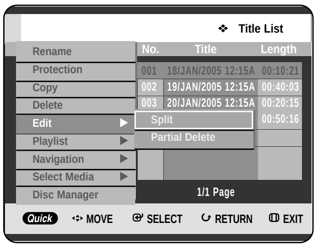
2 Press the ▲▼ buttons to select an entry you want to edit from the Title List, then press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

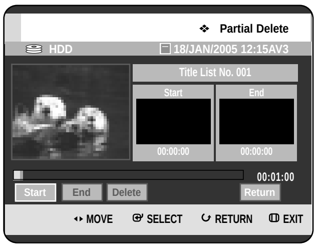
- When using DVD-RAM/-RW(VR) disc, you can select Partial Delete directly by pressing the **QUICK** button. (Then go to step 5)

3 Press the ▲▼ buttons to select **Edit**, then press the **OK** or ▶ button.
The Edit Title List screen is displayed.

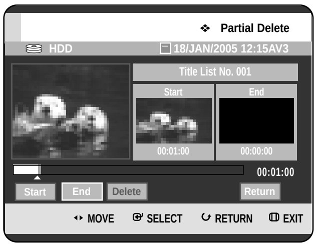

Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Split
Partial Delete
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
		00:50:16

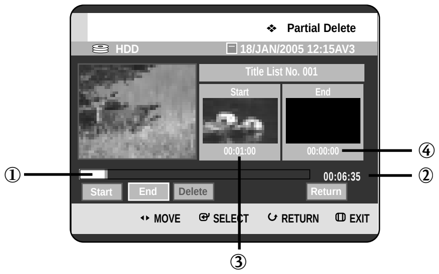
4 Press the ▲▼ buttons to select **Partial Delete**, then press the **OK** or ▶ button.


Partial Delete
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Start
End
00:00:00
00:00:00
00:01:00
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT

5 Press the **OK** button at the starting point.
The image and starting point time is displayed in the section deletion starting point window.


Partial Delete
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Start
End
00:01:00
00:00:00
00:01:00
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT

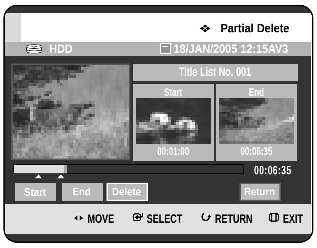
Edit Title List Screen Elements


Partial Delete
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Start
End
00:01:00
00:00:00
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT
①
②
③
④

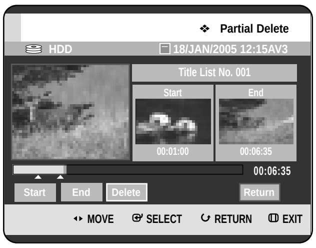
① Playback bar
② Current playtime
③ Section deletion starting point window and time
④ Section deletion end point window and time

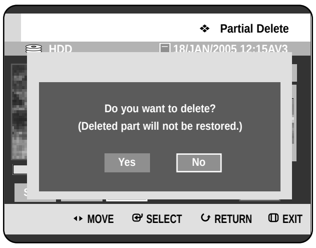
- Select the start and end points of the section you want to delete using the playback related buttons.
- Playback related buttons :
  (**PLAY(⏯)**, **SEARCH (⏪ ⏩)**)

6 Press the **OK** button at the end point.
The image and end point time is displayed in the Section deletion ending point window.


Partial Delete
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Start
End
00:01:00
00:06:35
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT

7 Press the ◀ ▶ buttons to select **Delete**, then press the **OK** button.


Partial Delete
HDD
18/JAN/2005 12:15AV3
Title List No. 001
Start
End
00:01:00
00:06:35
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT


Partial Delete
HDD
18/JAN/2005 12:15AV3
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete?
(Deleted part will not be restored.)

8 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button. The selected section has been deleted.

9 Press the ◀ ▶ buttons to select **Return**, then press the **OK** button to finish the operation.

NOTE

- The length of the section to be deleted must be at least 5 seconds long.
- If the length of the section to be deleted is less than 5 seconds, you will be prompted with the message “The range is too short.”.
- If the end time precedes the starting time, you will be prompted with the message “End point cannot be marked earlier than start point”.
- The section cannot be deleted when it includes a still picture.
- Press the **MENU** button after the operation has finished.
  The Title List screen will disappear.

Advanced Editing (Playlist)

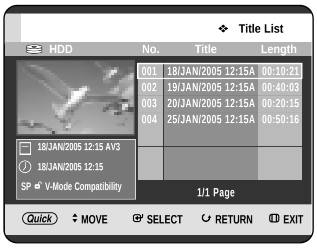
Creating a Playlist

Follow these instructions to create a new playlist entry from a recorded title.

HDD DVD-RAM DVD-RW
(VR mode)

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
Quick
MOVE
SELECT
RETURN
EXIT

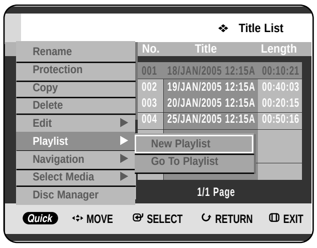
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.

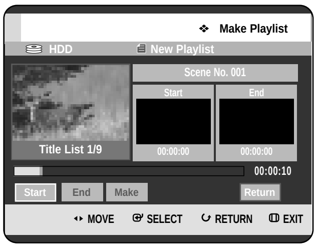
2 Press the **QUICK** button.
Press the ▲▼ buttons to select **Playlist**, then press the **OK** or ▶ button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
New Playlist
Go To Playlist
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

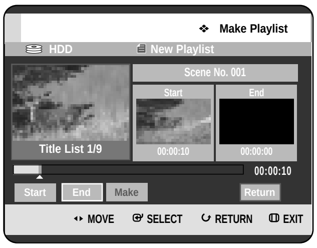
1/1 Page

3 Press the ▲▼ buttons to select **New Playlist**, then press the **OK** or ▶ button.
The image of the first titlelist is always displayed on the Make Playlist screen.


Make Playlist
HDD
New Playlist
Scene No. 001
Start
End
Title List 1/9
00:00:00
00:00:00
00:00:10
Start
End
Make
Return
MOVE
SELECT
RETURN
EXIT

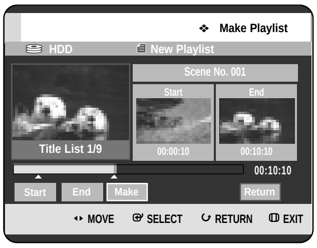
- To go to the desired titlelist, press the **SKIP** (⏮ ⏭) buttons.

4 Press the **OK** button at the start point.


Make Playlist
HDD
New Playlist
Scene No. 001
Start
End
Title List 1/9
00:00:10
00:00:00
00:00:10
Start
End
Make
Return
MOVE
SELECT
RETURN
EXIT

- The image and time at the start point is displayed on the Start window.
- The yellow-coloured selection bar moves to the End item.
- Select the starting point of the section from which you want to create a new scene using the playback related buttons (**PLAY(** ⏯ **)**, **SEARCH (** ⏪ ⏩ **)**).

5 Press the **OK** button at the end point.


Make Playlist
HDD
New Playlist
Scene No. 001
Start
End
Title List 1/9
00:00:10
00:10:10
00:10:10
Start
End
Make
Return
MOVE
SELECT
RETURN
EXIT

- The image and end point time is displayed in the End window.
- The yellow-coloured selection bar moves to the Make item.

6 Press the ◄ ► buttons to select **Make**, then press the **OK** button.

- To make a scene for playlist.
  A new Make scene screen is displayed.
  Repeat steps 3~6 to make scene of playlist.
  New scene will be added to the current playlist.
  You can check and see all the scenes on Edit playlist screen. (See page 106.)
- To make a new playlist.
  Repeat steps 1~6 if you want to make a new playlist.

7 Press the ◄ ► button to select **Return**, then press the **OK** button for finishing the operation.

NOTE

- You can create up to 99 playlist entries.
- Depending on the disc type, the displayed screen may have a slight difference.

Playing Entries in the Playlist

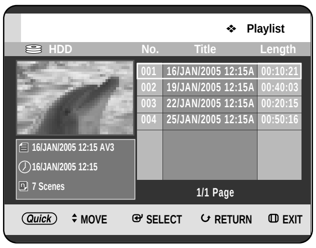
Follow these instructions to play the playlist entries.

HDD DVD-RAM DVD-RW

(VR mode)

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Playlist screen is displayed.



No.	Title	Length
001	16/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.
  The Title List screen is displayed.
- Press the **QUICK** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **OK** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select the playlist you want to play, then press the **OK** or **PLAY (⏯)** button.

3 Press the **STOP (⏹)** button to stop playing.
The screen returns to the Playlist screen.

Renaming a Playlist Entry

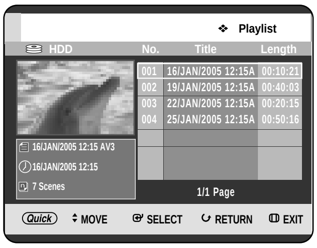
Follow these instructions to rename a playlist entry, i.e. to edit the title of a playlist entry.

HDD DVD-RAM DVD-RW

(VR mode)

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Edit Playlist screen is displayed.

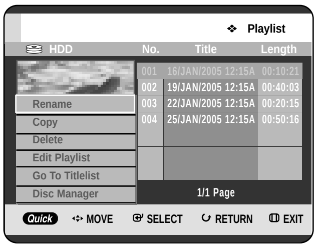

Playlist
HDD
16/JAN/2005 12:15 AV3
16/JAN/2005 12:15
7 Scenes
1/1 Page
Quick MOVE SELECT RETURN EXIT

No.	Title	Length
001	16/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

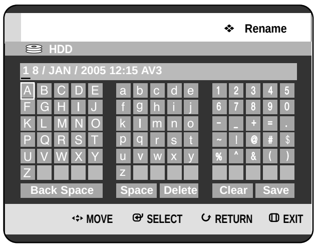
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.
  The Title List screen is displayed.
- Press the **QUICK** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **OK** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select the title you want to rename from the Playlist, then press the **QUICK** button.
QUICK menu is displayed : **Rename**, **Copy**, **Delete**, **Edit Playlist**, **Go To Titlelist**, **Disc Manager**


Playlist
HDD
Rename
Copy
Delete
Edit Playlist
Go To Titlelist
Disc Manager
1/1 Page
Quick MOVE SELECT RETURN EXIT

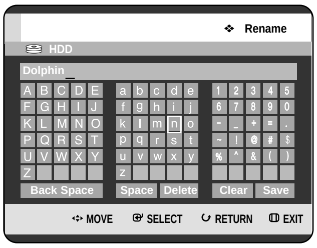
No.	Title	Length
001	16/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Rename**, then press the **OK** or ▶ button.
The Rename screen is displayed.


Rename
HDD
A B C D E a b c d e 1 2 3 4 5
F G H I J f g h i j 6 7 8 9 0
K L M N O k l m n o
P Q R S T p q r s t
U V W X Y u v w x y
Z z
Back Space Space Delete Clear Save
MOVE SELECT RETURN EXIT

1 8 / JAN / 2005 12:15 AV3

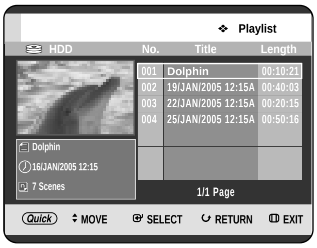
4 Select the desired characters using the ▲▼ ◀ ▶ buttons, then press the **OK** button.


Rename
HDD
A B C D E a b c d e 1 2 3 4 5
F G H I J f g h i j 6 7 8 9 0
K L M N O k l m n o
P Q R S T p q r s t
U V W X Y u v w x y
Z z
Back Space Space Delete Clear Save
MOVE SELECT RETURN EXIT

Dolphin_

- This function is the same as the Rename function in the renaming the title. (See page 96.)
- The maximum number of characters that can be entered is 31. All 31 characters can be displayed by pressing the **DISPLAY** button.

5 Press the ▲▼ ◀ ▶ buttons to select **Save**, then press the **OK** button.
The changed title is displayed in the title field of the selected playlist entry.


Playlist
HDD
Dolphin
16/JAN/2005 12:15
7 Scenes
1/1 Page
Quick MOVE SELECT RETURN EXIT

No.	Title	Length
001	Dolphin	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

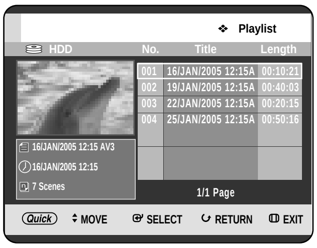
Editing a Scene for the Playlist

Follow these instructions to edit scenes for a playlist.

HDD DVD-RAM DVD-RW
(VR mode)

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Edit Playlist screen is displayed.

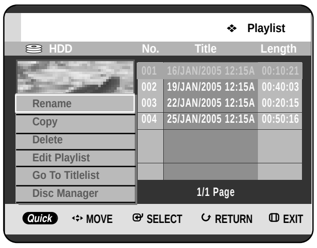

Playlist
HDD
16/JAN/2005 12:15 AV3
16/JAN/2005 12:15
7 Scenes
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	16/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

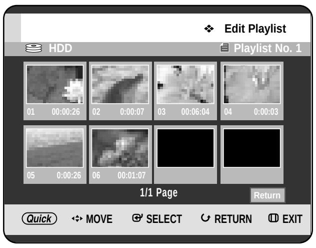
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.
  The Title List screen is displayed.
- Press the **QUICK** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **OK** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select the title you want to edit from the Playlist, then press the **QUICK** button.
The Edit Playlist menu is displayed: **Rename**, **Copy**, **Delete**, **Edit Playlist**, **Go To Titlelist**, **Disc Manager**.


Playlist
HDD
Rename
Copy
Delete
Edit Playlist
Go To Titlelist
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

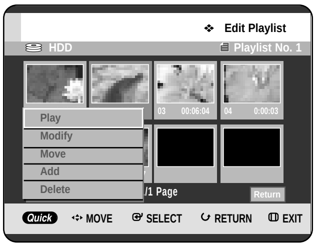
No.	Title	Length
001	16/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Edit Playlist**, then press the **OK** or ▶ button.
The Edit Scene screen is displayed.


Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 0:00:07
03 00:06:04
04 0:00:03
05 0:00:26
06 00:01:07
1/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

Playing a Selected Scene

4 Press the ▲▼◀ ▶ buttons to select the scene you want to play, then press the **QUICK** button.
The playlist entry to be played is selected.


Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

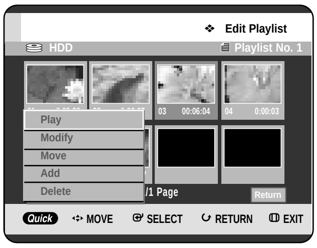
5 Press the ▲▼ buttons to select **Play**, then press the **OK** or ▶ button.
The selected scene is played.

- To stop scene play, press the **STOP (**⊡**)** button.

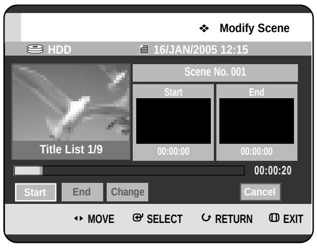
Modifying a Scene (Replacing a Scene)

To setup, follow steps 1 to 3 on page 106.

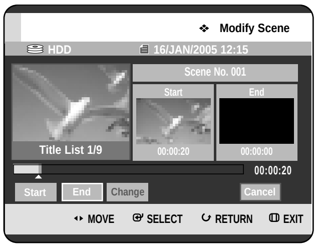
4 Press the ▲▼◀ ▶ buttons to select the scene you want to modify, then press the **QUICK** button.


Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Modify**, then press the **OK** or ▶ button.
The Modify Scene screen is displayed.

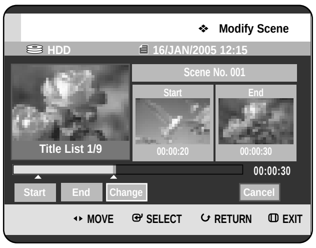

Modify Scene
HDD
16/JAN/2005 12:15
Scene No. 001
Start
End
Title List 1/9
00:00:00
00:00:00
00:00:20
Start
End
Change
Cancel
MOVE
SELECT
RETURN
EXIT

6 Press the **OK** button at the start point of the scene.


Modify Scene
HDD
16/JAN/2005 12:15
Scene No. 001
Start
End
Title List 1/9
00:00:20
00:00:00
00:00:20
Start
End
Change
Cancel
MOVE
SELECT
RETURN
EXIT

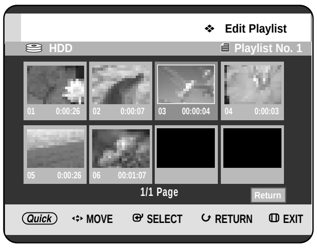
- The image and starting point time is displayed on the Start window.
- Select the starting or ending point of the section you want to modify using the playback related buttons (**PLAY(⏯)**, **SEARCH (⏪ ⏩)**).

7 Press the **OK** button at the end point of the scene.


Modify Scene
HDD
16/JAN/2005 12:15
Scene No. 001
Start
End
Title List 1/9
00:00:20
00:00:30
00:00:30
Start
End
Change
Cancel
MOVE
SELECT
RETURN
EXIT

- The image and ending point time is displayed in the End window.

8 Press the ◀ ▶ buttons to select **Change**, then press the **OK** button.

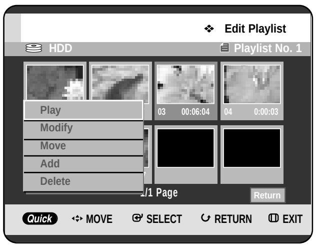

Edit Playlist
HDD
Playlist No. 1
01 0:00:26
02 0:00:07
03 00:00:04
04 0:00:03
05 0:00:26
06 00:01:07
1/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

- The scene you want to modify is changed with the selected section.

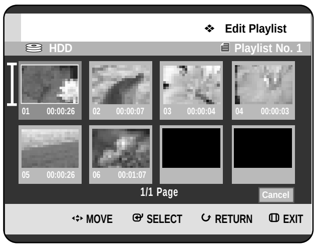
Moving a Scene (Changing the Position of a Scene)

To setup, follow steps 1 to 3 on page 106.

4 Press the ▲▼ ◀ ▶ buttons to select the scene you want to move (change the position), then press the **QUICK** button.

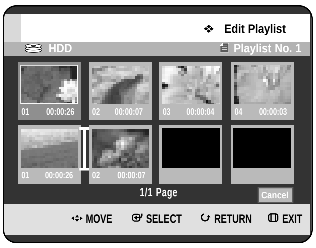

Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
1/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Move**, then press the **OK** or ▶ button.

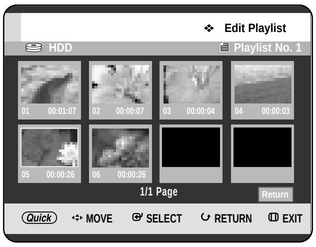

Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 00:00:07
03 00:00:04
04 00:00:03
05 00:00:26
06 00:01:07
1/1 Page
Cancel
MOVE
SELECT
RETURN
EXIT

- A yellow selection window is displayed on the scene to be moved.

6 Press the ▲▼ ◀ ▶ buttons to select the position to which you want to move the selected scene, then select the **OK** button.


Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 00:00:07
03 00:00:04
04 00:00:03
01 00:00:26
02 00:00:07
1/1 Page
Cancel
MOVE
SELECT
RETURN
EXIT

- The selected scene is moved to the selected position.


Edit Playlist
HDD
Playlist No. 1
01 00:01:07
02 00:00:07
03 00:00:04
04 00:00:03
05 00:00:26
06 00:00:26
1/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

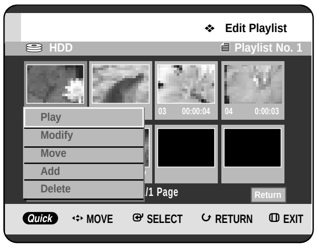
NOTE

- You cannot move the selected scene to the position of the next scene, because the selected scene should be inserted before that position, which requires no action.
- Depending on the disc type, the displayed screen may have a slight difference.

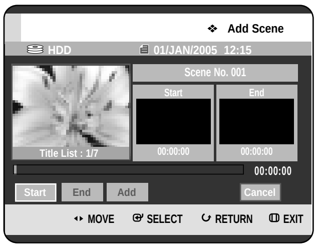
Adding a Scene

To setup, follow steps 1 to 3 on page 106.

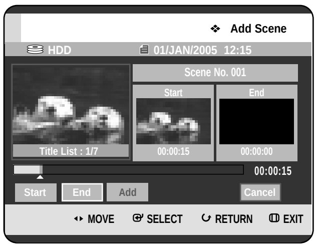
4 Press the ▲▼◀▶ buttons to select the scene that will have a new scene inserted before it, then press the **QUICK** button.


Edit Playlist
HDD
Playlist No. 1
03 00:00:04
04 0:00:03
Play
Modify
Move
Add
Delete
1/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Add**, then press the **OK** or ▶ button.
The Add Scene screen is displayed.

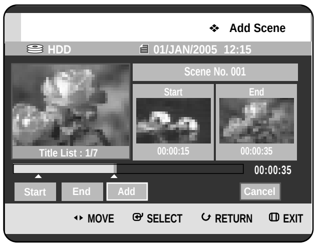

Add Scene
HDD
01/JAN/2005 12:15
Scene No. 001
Start
End
Title List : 1/7
00:00:00
00:00:00
00:00:00
Start
End
Add
Cancel
MOVE
SELECT
RETURN
EXIT

6 Press the **OK** button at the starting point of the scene.


Add Scene
HDD
01/JAN/2005 12:15
Scene No. 001
Start
End
Title List : 1/7
00:00:15
00:00:00
00:00:15
Start
End
Add
Cancel
MOVE
SELECT
RETURN
EXIT

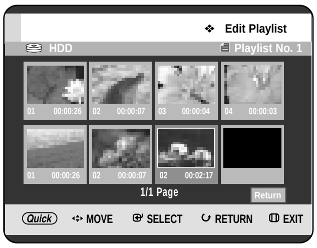
- The image and starting point time is displayed on the Start window.
- Select the starting or ending point of the section you want to modify using the playback related buttons (**PLAY(⏯)**, **SKIP (⏮ ⏭)**).

7 Press the **OK** button at the end point of the scene.


Add Scene
HDD
01/JAN/2005 12:15
Scene No. 001
Start
End
Title List : 1/7
00:00:15
00:00:35
00:00:35
Start
End
Add
Cancel
MOVE
SELECT
RETURN
EXIT

- The image and time of the end point is displayed in the End window.
- To cancel, press the ◀▶ buttons to select **Cancel**, then press the **OK** button.

8 Press the ◀▶ buttons to select **Add**, then press the **OK** button.

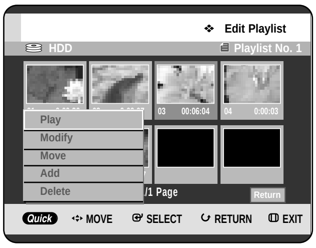

Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 00:00:07
03 00:00:04
04 00:00:03
01 00:00:26
02 00:00:07
02 00:02:17
1/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

- The section you want to add is inserted prior to the scene selected in step 4 of Adding a Scene on the left.

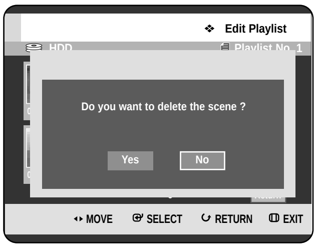
Deleting a Scene

To setup, follow steps 1 to 3 on page 106.

4 Press the ▲▼ ◀ ▶ buttons to select the scene you want to delete, then press the **QUICK** button.


Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
/1 Page
Return
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Delete**, then press the **OK** or ▶ button.


Edit Playlist
HDD
Playlist No. 1
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete the scene ?

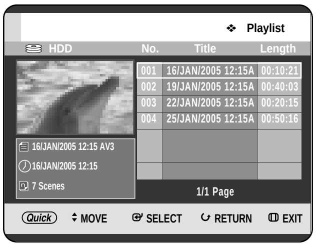
- The message “Do you want to delete the scene ?” is displayed.

6 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** to delete the selected scene.

Deleting a Playlist Entry from the Playlist

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Edit Playlist screen is displayed.


Playlist
HDD
Quick
MOVE
SELECT
RETURN
EXIT

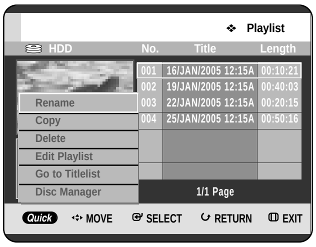
No.	Title	Length
001	16/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	22/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

16/JAN/2005 12:15 AV3
16/JAN/2005 12:15
7 Scenes
1/1 Page

Using the MENU button.

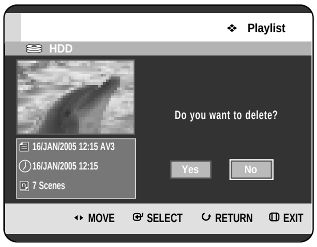
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice. The Title List screen is displayed.
- Press the **QUICK** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **OK** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **OK** or ▶ button.

2 Press the ▲▼ buttons to select the title you want to edit from the Playlist, then press the **QUICK** button.
The Edit Playlist menu is displayed:**Rename**, **Copy**, **Delete**, **Edit Playlist**, **Go To Titlelist**, **Disc Manager**.


Playlist
HDD
No.
Title
Length
001 16/JAN/2005 12:15A 00:10:21
002 19/JAN/2005 12:15A 00:40:03
003 22/JAN/2005 12:15A 00:20:15
004 25/JAN/2005 12:15A 00:50:16
Rename
Copy
Delete
Edit Playlist
Go to Titlelist
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Delete**, then press the **OK** or ▶ button.

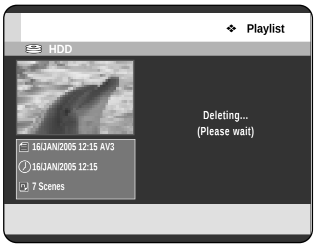
- You will be prompted with the delete confirmation message “Do you want to delete?”.



Do you want to delete?

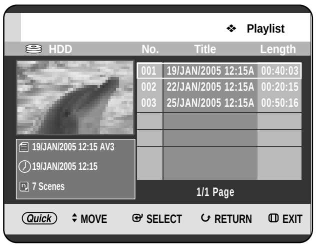
Playlist
HDD
16/JAN/2005 12:15 AV3
16/JAN/2005 12:15
7 Scenes
Yes
No
MOVE
SELECT
RETURN
EXIT

4 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
You automatically returned to the Playlist screen after the delete operation has finished.



Deleting...
(Please wait)

Playlist
HDD
16/JAN/2005 12:15 AV3
16/JAN/2005 12:15
7 Scenes



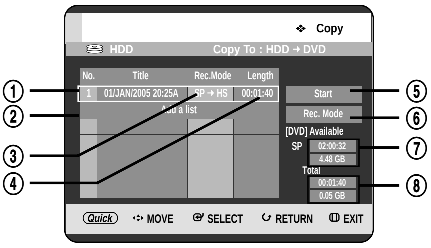
No.	Title	Length
001	19/JAN/2005 12:15A	00:40:03
002	22/JAN/2005 12:15A	00:20:15
003	25/JAN/2005 12:15A	00:50:16

1/1 Page

Playlist
HDD
19/JAN/2005 12:15 AV3
19/JAN/2005 12:15
7 Scenes
Quick
MOVE
SELECT
RETURN
EXIT

Copying from HDD to DVD

About the Copy Screen



No.	Title	Rec.Mode	Length
1	01/JAN/2005 20:25A	SP ➔ HS	00:01:40

Copy
HDD
Copy To : HDD ➔ DVD
Add a list
Start
Rec. Mode
[DVD] Available
SP
02:00:32
4.48 GB
Total
00:01:40
0.05 GB
Quick
MOVE
SELECT
RETURN
EXIT
①
②
③
④
⑤
⑥
⑦
⑧

① Title to be copied
② Add titles to be copied (up to 7 titles can be copied at one time)
③ Recording mode for copying
  - HS(high speed): you can copy faster than normal playback speed.
    Copies in the same record mode as source title.
  - XP/SP/LP/EP : you cannot use high speed copy.
④ Record time of title to be copied
⑤ Copy start selection
⑥ Record mode setup selection
⑦ Remaining time and space on the current disc in DVD Record mode
⑧ Total record time and space of selected titles for copying

Contents Copy Specifications

Contents	HDD ➔ DVD
Recorded Video Title	Supported
Copy Protected Title	Not supported
Copy Once Title	Move (Deletes the Title in the HDD after copying)

Once "Copy Once programme" has been recorded on the DVD disc, this title cannot be copied to HDD anymore. But "Copy Once programme" has been recorded on the HDD, this title can be copied to DVD-RW(VR mode) or DVD-RAM.

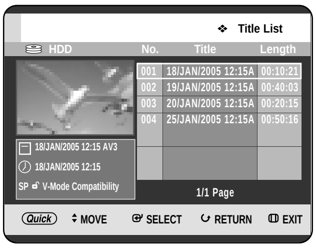
Using the TITLE LIST button

1 Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display. Check that the disc has enough available space for the recording.

3 Select the HDD by pressing the **HDD** button on the front panel of the HDD & DVD RECORDER or on the remote control.

4 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.
  The Title List screen is displayed.

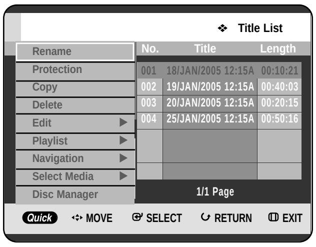
5 Press the ▲▼ buttons to select the title you want to copy.

To move to other pages, press the **SKIP(⏮ ⏭)** buttons.

SKIP(⏮) : previous page of title list

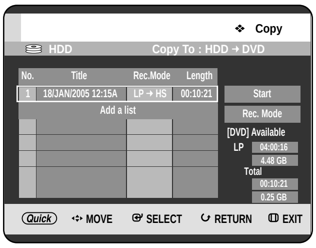
SKIP(⏭) : next page of title list

6 Press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

7 Press the ▲▼ buttons to select **Copy**, then press the **OK** or ▶ button.
Copy screen is displayed.

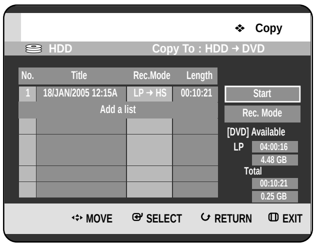

Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:10:21
0.25 GB

- If you want to change the record mode when copying, see page 117.

8 Press the **OK** or ▶ button to select **Start**, then press the **OK** button.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:10:21
0.25 GB

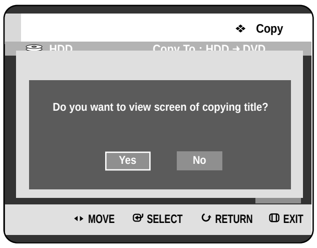
- About Using COPY button -

Press the ▲▼ buttons to select title you want to copy from the title list and then press the **COPY** button on the remote control. Copy screen is displayed.

- During the playback, you can also copy the title by pressing the **COPY** button.

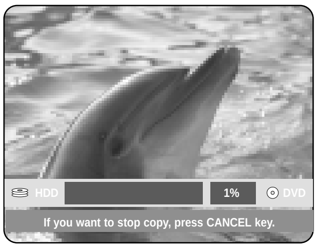
- Copying a Title that has been edited once before -

9 The “Do you want to view screen of copying title?” message is displayed.



Do you want to view screen of copying title?

10 To copy a title while viewing the title on the copy screen, press the ◄ ► buttons to select **Yes**, then press the **OK** button.

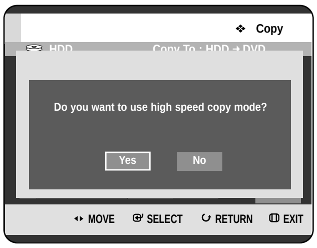


If you want to stop copy, press CANCEL key.

- If **No** is selected, the title to be copied is not displayed screen, and copying begins while the current broadcasting programme is displayed on the screen.
- To cancel the copying in progress, press the **CANCEL** button.

- Copying an Unedited title -

9-1 The “Do you want to use high speed copy mode?” message is displayed.

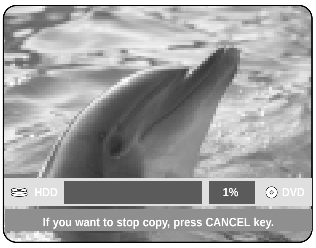


Do you want to use high speed copy mode?

NOTE

- High speed copy : This means that you can transfer without having to worry about the quality getting worse with each copy ‘generation’. It also means that copying can be carried out at the maximum speed possible.

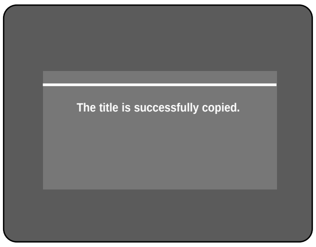
10-1 To begin high speed copy, press the ◄ ► buttons to select **Yes**, then press the **OK** button.
High speed copy begins. The title to be copied is not played back, while the current broadcasting programme is displayed on the screen.



If you want to stop copy, press CANCEL key.

- If **No** is selected, the title to be copied is displayed at its playback speed while copying.
- To cancel the copying in progress, press the **CANCEL** button.

11-1 After a successful copy, “The title is successfully copied” message is displayed.

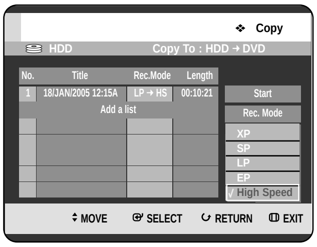


The title is successfully copied.

Changing the Record Mode

To setup, follow steps 1 to 7 on page 112.

8 Press the ▶▼ buttons to select **Rec. Mode**, then press the **OK** button.



No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
	Add a list		

9 Press the ▲▼ buttons to select record mode you want to record, then press the **OK** button.

- HS(High Speed) : Copies in the same record mode as HDD.
- XP/SP/LP/EP : You cannot copy the higher quality mode than original. If the same record mode is selected, the title is copied at high speed.

NOTE

- Using the same method, you can copy a Playlist.
- High speed copying is not available for a title list that has been deleted partially.
- During copying, timer recording is not available.
- High speed copying is not available when:
  - Copying a title that can only be copied once
  - Copying a playlist
  - Copying a partially-deleted title
- Regarding title lists that can be copied only once:
  - Only available for DVD discs that support CPRM.
  - If a playlist contains a scene that can only be copied once, it cannot be copied.

Copying Multiple Titles at One Time

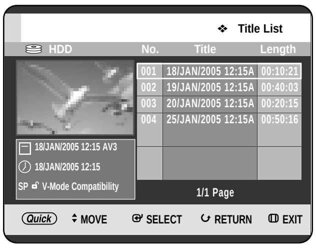
Using the TITLE LIST button

1 Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display. Check that the disc has enough available space for the recording.

3 Select the HDD by pressing the **HDD** button on the front panel of the HDD & DVD RECORDER or on the remote control.

4 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.



No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

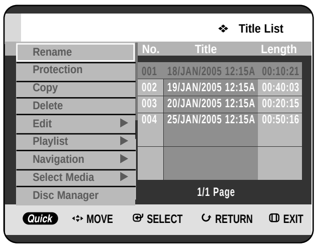
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button twice.
  The Title List screen is displayed.

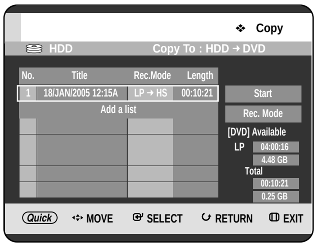
5 Press the ▲▼ buttons to select the title you want to copy.
To move to other pages, press the **SKIP (** ⏮ ⏭ **)** buttons.
SKIP(⏮ **)** : previous page of title list
SKIP(⏭ **)** : next page of title list

6 Press the **QUICK** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

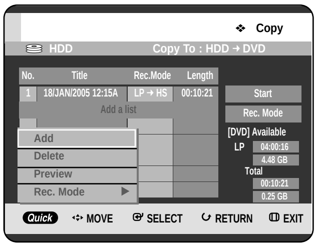
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

7 Press the ▲▼ buttons to select **Copy**, then press the **OK** or ▶ button.
Copy screen is displayed.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
[DVD] Available
LP
04:00:16
4.48 GB
Total
00:10:21
0.25 GB
Quick
MOVE
SELECT
RETURN
EXIT

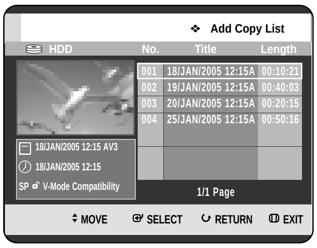
No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21

8 Press the **QUICK** button.


Copy
HDD
Copy To : HDD → DVD
Add a list
Add
Delete
Preview
Rec. Mode
Start
Rec. Mode
[DVD] Available
LP
04:00:16
4.48 GB
Total
00:10:21
0.25 GB
Quick
MOVE
SELECT
RETURN
EXIT

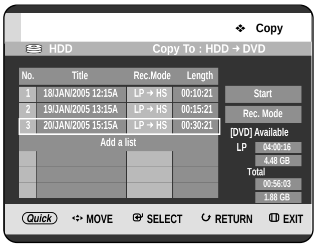
No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21

9 Press the ▲▼ buttons to select **Add**, then press the **OK** button.
Add Copy List screen is displayed.
Other method: Press the ▲▼ buttons to select **Add a list**, then press the **OK** button.


Add Copy List
HDD
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
MOVE
SELECT
RETURN
EXIT

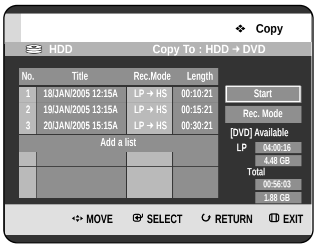
No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

10 Press the ▲▼ buttons to select an additional title you want to copy, then press the **OK** button.
Repeat steps 8~10 to select a title you want to copy.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
[DVD] Available
LP
04:00:16
4.48 GB
Total
00:56:03
1.88 GB
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	LP → HS	00:15:21
3	20/JAN/2005 15:15A	LP → HS	00:30:21

11 Press the **OK** or ▶ buttons to select **Start**, then press the **OK** button.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
[DVD] Available
LP
04:00:16
4.48 GB
Total
00:56:03
1.88 GB
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	LP → HS	00:15:21
3	20/JAN/2005 15:15A	LP → HS	00:30:21

The added title lists into the copy list are copied.
To cancel the copying in progress, press the **CANCEL** button.

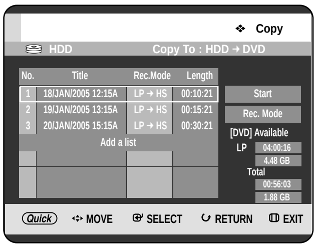
NOTE

- If copy list contains at least one title that cannot be copied at high speed, it performs the step 9 described on page 114. Otherwise, it performs the step 9-1 described on page 113.

Deleting an Undesired Title from the Copy List

To setup, follow steps 1 to 7 on pages 114~115.

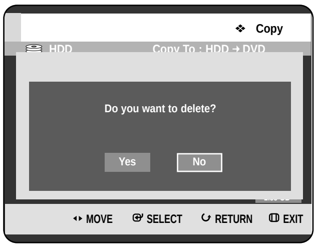
8 Press the ▲▼ buttons to select a title you want to delete from the copy screen.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	LP → HS	00:15:21
3	20/JAN/2005 15:15A	LP → HS	00:30:21
	Add a list		

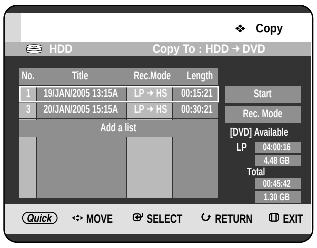
[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

9 Press the **QUICK** button. Press the ▲▼ buttons to select **Delete**, then press the **OK** or ▶ button.
The message “Do you want to delete?” is displayed.


Copy
HDD
Copy To : HDD → DVD
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete?

10 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
The selected title is deleted.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Quick
MOVE
SELECT
RETURN
EXIT

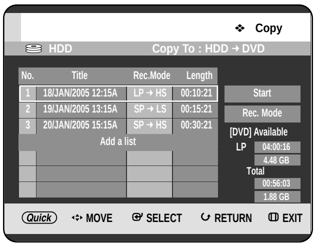
No.	Title	Rec.Mode	Length
1	19/JAN/2005 13:15A	LP → HS	00:15:21
3	20/JAN/2005 15:15A	LP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:45:42
1.30 GB

Previewing a Selected Title from the Copy List

To setup, follow steps 1 to 7 on pages 114~115.

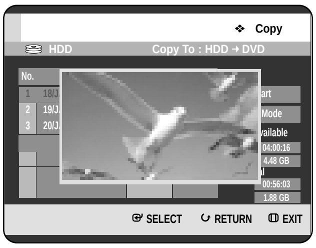
8 Press the ▲▼ buttons to select a title you want to preview in the copy screen.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	SP → LS	00:15:21
3	20/JAN/2005 15:15A	SP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

9 Press the **QUICK** button. Press the ▲▼ buttons to select **Preview**, then press the **OK** or ▶ button.
You can preview the selected title through the display window located at the centre of the screen.


Copy
HDD
Copy To : HDD → DVD
SELECT
RETURN
EXIT

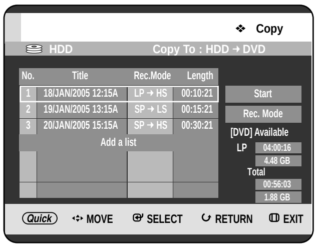
10 Press the **RETURN** button to exit the Preview mode.

Selecting Record Mode of Each Title from the Copy List

You can copy multiple titles while setting different record modes for each title.

To setup, follow steps 1 to 7 on pages 114~115.

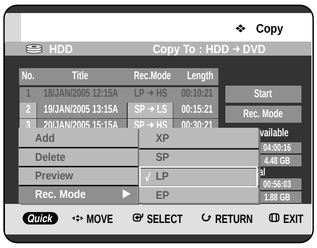
8 Press the ▲▼ buttons to select a title to change its record mode in the copy screen.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	SP → LS	00:15:21
3	20/JAN/2005 15:15A	SP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

9 Press the **QUICK** button. Press the ▲▼ buttons to select **Rec. Mode**, then press the **OK** or ▶ button.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Add
Delete
Preview
Rec. Mode ▶
XP
SP
√ LP
EP
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	SP → LS	00:15:21
3	20/JAN/2005 15:15A	SP → HS	00:30:21

04:00:16
4.48 GB
00:56:03
1.88 GB

10 Press the ▲▼ buttons to select the record mode you want, then press the **OK** or ▶ button.

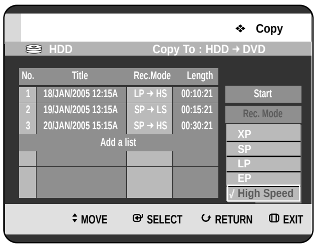
11 Repeat steps 9~10 to select a title to change its record mode.
Rest of the copying process can be performed as described on pages 112 to 113.

Changing Record Mode of All Titles from the Copy List

You can copy multiple titles while setting the same record mode for all titles.

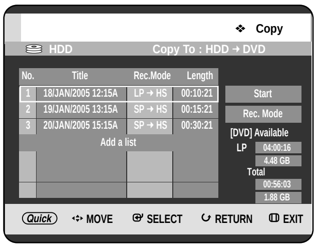
To setup, follow steps 1 to 7 on pages 114~115.

8 Select the **Rec. Mode** on the right-hand side on the screen using the ▲▼◀ ▶ buttons, then press the **OK** button.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
XP
SP
LP
EP
√ High Speed
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	SP → LS	00:15:21
3	20/JAN/2005 15:15A	SP → HS	00:30:21
	Add a list		

9 Press the ▲▼ buttons to select the record mode you want, then press the **OK** button.
Rest of the copying process can be performed as described on pages 112~113.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21
2	19/JAN/2005 13:15A	SP → HS	00:15:21
3	20/JAN/2005 15:15A	SP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

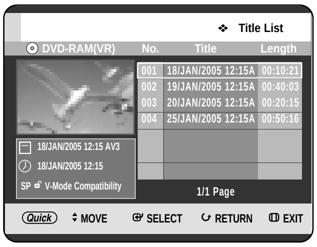
Copying from DVD to HDD

Using the TITLE LIST button

1 Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray.

3 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


❖ Title List
DVD-RAM(VR)
18/JAN/2005 12:15 AV3
18/JAN/2005 12:15
SP V-Mode Compatibility
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

Using the MENU button.

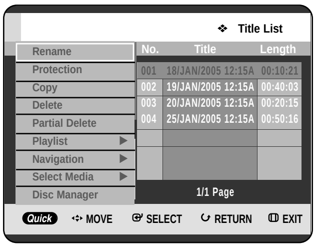
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **OK** or ▶ button.
- Press the ▲▼ buttons to select **Title List**, then press the **OK** or ▶ button.
  The Title List screen is displayed.

4 Press the ▲▼ buttons to select the title you want to copy.
To move to other pages, press the **SKIP (⏮ ⏭)** buttons.

SKIP(⏮) : previous page of title list

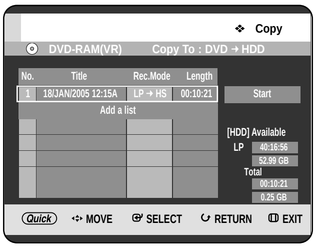
SKIP(⏭) : next page of title list

5 Press the **QUICK** button.


❖ Title List
Rename
Protection
Copy
Delete
Partial Delete
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	18/JAN/2005 12:15A	00:10:21
002	19/JAN/2005 12:15A	00:40:03
003	20/JAN/2005 12:15A	00:20:15
004	25/JAN/2005 12:15A	00:50:16

6 Press the ▲▼ buttons to select **Copy**, then press the **OK** or ▶ button.
Copy screen is displayed.


❖ Copy
DVD-RAM(VR)
Copy To : DVD → HDD
Start
Add a list
Quick
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	18/JAN/2005 12:15A	LP → HS	00:10:21

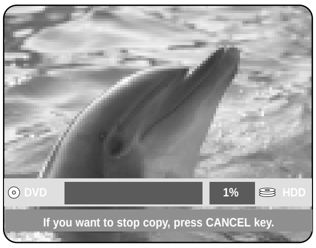
[HDD] Available
LP 40:16:56
52.99 GB
Total 00:10:21
0.25 GB

- About Using COPY button -

Press the ▲▼ buttons to select title you want to copy from the title list and then press the **COPY** button on the remote control. Copy screen is displayed.

- During the playback, you can also copy the title by pressing the **COPY** button.

7 Press the **OK** or ▶ buttons to select **Start**, then press the **OK** button.



If you want to stop copy, press CANCEL key.

- Copying begins while the current broadcasting programme is displayed on the scrren.

8 After a successful copy, “The title is successfully copied.” message is displayed.

The title is successfully copied

- Copying Multiple Titles at One Time – Same as an HDD operation (See pages 114~115)
- Deleting an Undesired Title from the Copy List – Same as an HDD operation (See page 116)
- Previewing a Selected Title from the Copy List – Same as an HDD operation (See page 116)

NOTE

- You cannot copy anything else on finalised DVD-R and DVD-RW(V mode) mode.
- You cannot copy a DVD-VIDEO to HDD.
- Only video will be copied from title lists or playlist that contains still images.
- High speed copying from a DVD-RAM or DVD-RW (VR mode) is available.
- When you copy from DVD-RW(V mode)/-R disc to HDD, high speed copy is not available.
- Record mode cannot be changed when you copy a title from DVD to HDD.

Contents Copy Specifications

Contents	DVD ➔ HDD
Recorded Video Title	Supported
Copy Protected Title	Not supported
Copy Once Title	Not supported

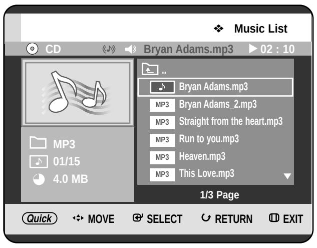
Copying MP3 or JPEG Files from a Disc to HDD

File Copy

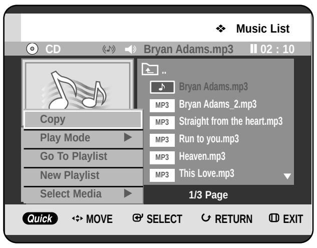
1 Insert a JPEG disc or MP3 disc into the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display. Check that the disc has enough available space for the recording.

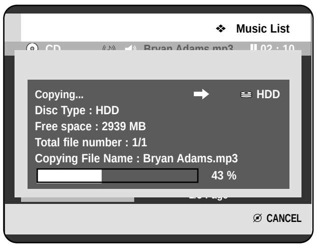
3 Press the ▲▼ buttons to select **Music** or **Photo**, then press the **OK** or ▶ button.
MP3 or JPEG file list is displayed.


❖ Music List
CD
Bryan Adams.mp3
▶ 02 : 10
..
Bryan Adams.mp3
MP3 Bryan Adams_2.mp3
MP3 Straight from the heart.mp3
MP3 Run to you.mp3
MP3 Heaven.mp3
MP3 This Love.mp3
MP3
01/15
4.0 MB
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select the MP3 or JPEG file you want to copy, then press the **QUICK** button.


Music List
CD
Bryan Adams.mp3
02 : 10
..
Bryan Adams.mp3
Bryan Adams_2.mp3
Straight from the heart.mp3
Run to you.mp3
Heaven.mp3
This Love.mp3
Copy
Play Mode
Go To Playlist
New Playlist
Select Media
1/3 Page
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Copy**, then press the **OK** or ▶ button.
File copy begins.


Music List
HDD
CANCEL

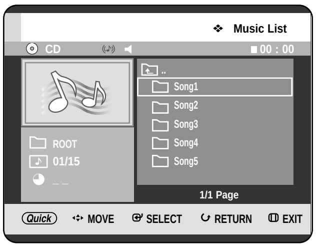
Copying...
Disc Type : HDD
Free space : 2939 MB
Total file number : 1/1
Copying File Name : Bryan Adams.mp3
43 %

- The copying of only one file cannot be cancelled. The MP3/JPEG file is located either under the HDD's Music or Photo folder after the file is copied from a disc to HDD.

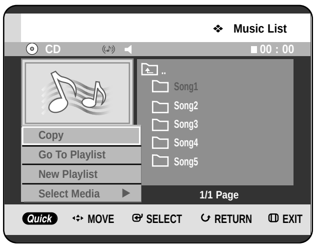
Folder Copy

Do steps 1 to 3 on page 119.

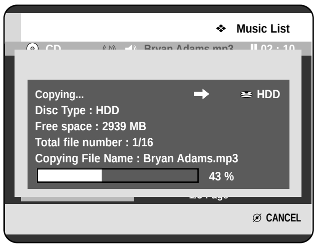
4 Press the ▲ button to select 📁.., then press the **OK** button.
All MP3 or JPEG folders are displayed.


Music List
CD
00 : 00
..
Song1
Song2
Song3
Song4
Song5
ROOT
01/15
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select the MP3 or JPEG folder you want to copy, then press the **QUICK** button.


Music List
CD
00 : 00
..
Song1
Song2
Song3
Song4
Song5
Copy
Go To Playlist
New Playlist
Select Media
1/1 Page
Quick
MOVE
SELECT
RETURN
EXIT

6 Press the ▲▼ buttons to select **Copy**, then press the **OK** or ▶ button.
Folder copy begins.
Subfolders and files in the selected folder are copied.


Music List
HDD
CANCEL

Copying...
Disc Type : HDD
Free space : 2939 MB
Total file number : 1/16
Copying File Name : Bryan Adams.mp3
43 %

NOTE

- Press the **CANCEL** button during folder copying will cancel the folder copying after the current file is copied.
- Up to 1,500 files and 1,000 subfolders can be copied into one folder for MP3 files.
- Up to 4,500 files and 1,000 subfolders can be copied into one folder for JPEG files.
- Files having an existing name of ***.mp3/***.jpg, is automatically renamed and copied to ***01.mp3/***01.jpg.
- It allows up to 999 copies to have the same name.
- You cannot copy an Audio CD.
- MP3 or JPEG files can be copied only from a disc to the HDD.
- The file size in a disc and the copied one in the HDD may be slightly different due to the file system.

Contents Copy Specifications

Contents	HDD ➝ DVD	DVD ➝ HDD
MP3	Not supported	supported
JPEG(photo)	Not supported	supported
DivX	Not supported	Not supported

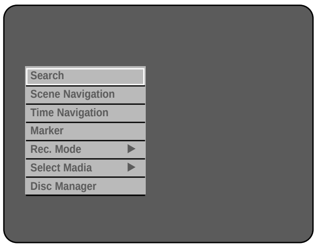
Disc Manager

Editing the Disc Name

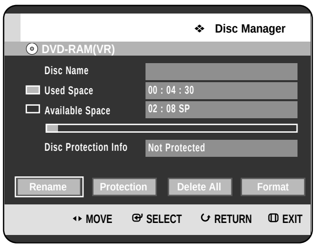
Follow these instructions to give a name to a disc.

DVD-RAM DVD-RW DVD-R

1 With the unit in Stop mode, press the **QUICK** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ▶ button.


Disc Manager
DVD-RAM(VR)

Disc Name

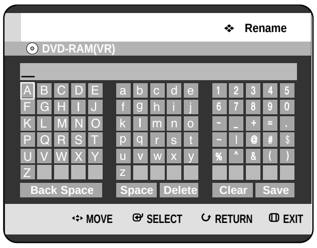
Used Space 00 : 04 : 30

Available Space 02 : 08 SP

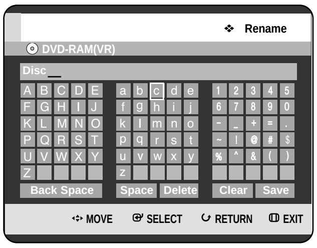
Disc Protection Info Not Protected

Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

3 Press the ◄ ► buttons to select **Rename**, then press the **OK** button.
The Rename screen is displayed.

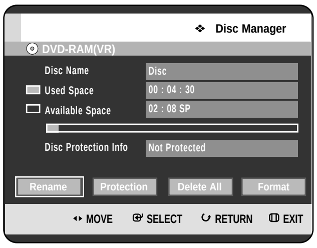

Rename
DVD-RAM(VR)
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

4 Select the desired characters using the ▲▼ ◄ ► buttons, then press the **OK** button.


Rename
DVD-RAM(VR)
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

Disc

5 Press the ▲▼ ◄ ► buttons to select **Save**, then press the **OK** button.
A disc name is given to the disc.


Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name: Disc
Used Space: 00 : 04 : 30
Available Space: 02 : 08 SP
Disc Protection Info: Not Protected

NOTE

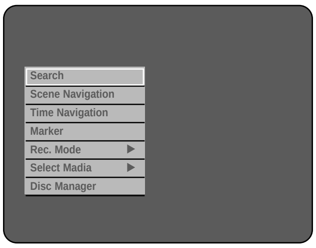
- You may need to clear disc protect before beginning editing.
- Depending on the disc type, the displayed screen may be different.

Disc Protection

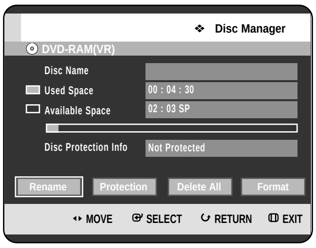
Disc Protection allows you to protect your discs from being formatted or deleted due to unintended operations.

DVD-RAM DVD-RW DVD-R

1 With the unit in Stop mode, press the **QUICK** button.

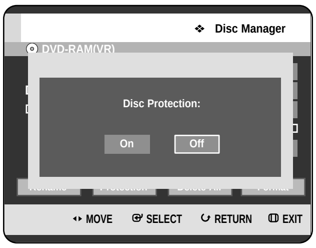

Search
Scene Navigation
Time Navigation
Marker
Rec. Mode
Select Madia
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ► button.


Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name
Used Space: 00 : 04 : 30
Available Space: 02 : 03 SP
Disc Protection Info: Not Protected

3 Press the ◄ ► buttons to select **Protection**, then press the **OK** button.


Disc Manager
DVD-RAM(VR)
Disc Protection:
On
Off
MOVE
SELECT
RETURN
EXIT

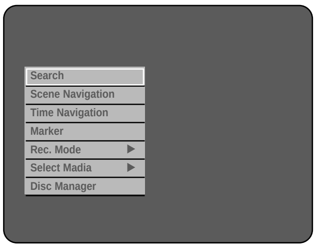
4 Press the ◄ ► buttons to select **On**, then press the **OK** button.

Formatting a Disc

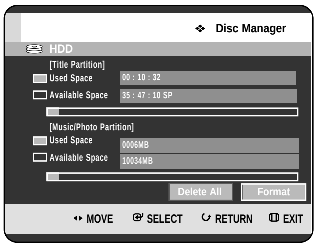
Use these instructions to format a disc.
The disc protect should also be cleared.

HDD DVD-RAM DVD-RW

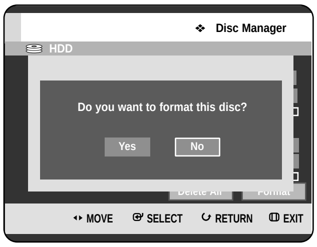
1 With the unit in Stop mode, press the **QUICK** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ▶ button.


Disc Manager
HDD
[Title Partition]
Used Space
00 : 10 : 32
Available Space
35 : 47 : 10 SP
[Music/Photo Partition]
Used Space
0006MB
Available Space
10034MB
Delete All
Format
MOVE
SELECT
RETURN
EXIT

3 Press the ◀ ▶ buttons to select **Format**, then press the **OK** button.


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

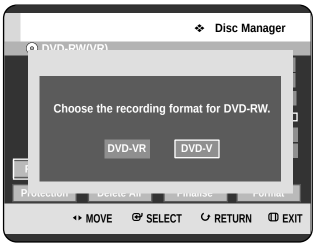
Do you want to format this disc?

HDD/DVD-RAM

- You will be prompted with the confirmation message “Do you want to format this disc?”.
- If you select **Yes**, you will be prompted with the confirmation message “All data will be deleted. Do you want to continue?”.

DVD-RW

- You will be prompted with the confirmation message “Choose the recording format for DVD-RW.”


Disc Manager
DVD-VR
DVD-V
MOVE
SELECT
RETURN
EXIT

Choose the recording format for DVD-RW.

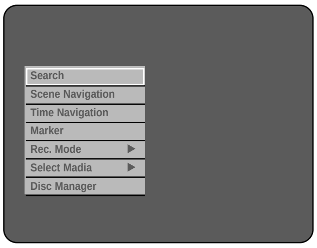
4 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button. The disc is formatted.

DVD-VR and DVD-V are defined according to their recording format.

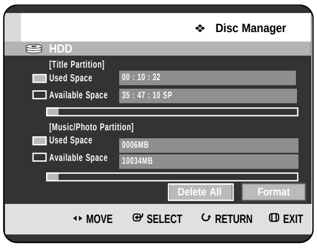
	DVD-VR	DVD-V
DISC	DVD-RAM DVD-RW	DVD-RW DVD-R

Delete All Title Lists/Music Lists/Photo Lists

1 With the unit in Stop mode, press the **QUICK** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

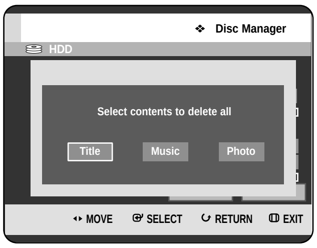
2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ▶ button.


Disc Manager
HDD
MOVE
SELECT
RETURN
EXIT
Delete All
Format

[Title Partition]
Used Space 00 : 10 : 32
Available Space 35 : 47 : 10 SP

[Music/Photo Partition]
Used Space 0006MB
Available Space 10034MB

3 Press the ◀ ▶ buttons to select **Delete All**, then press the **OK** button.

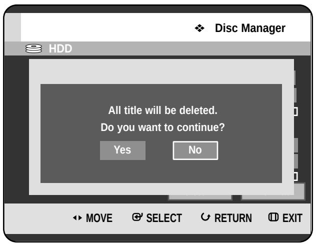

Disc Manager
HDD
Title
Music
Photo
MOVE
SELECT
RETURN
EXIT

Select contents to delete all

- When Protected Entry exists: The Delete All Title List function will not operate. If there is a title containing a still picture, the function will not operate. If you want to delete a protected entry, disable Protect on the Lock item.

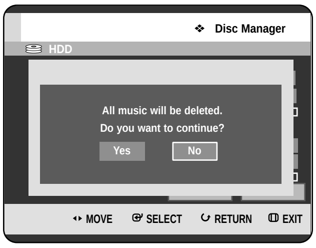
4 Press the ◀ ▶ buttons to select the **Title**, **Music** or **Photo**, then press the **OK** button.

Title


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

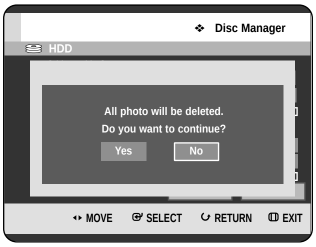
All title will be deleted.
Do you want to continue?

Music


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

All music will be deleted.
Do you want to continue?

Photo


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

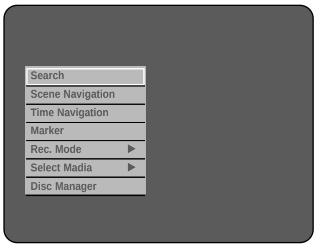
All photo will be deleted.
Do you want to continue?

5 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
All title lists, music lists or photo lists are deleted.

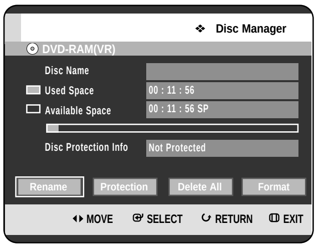
Delete All Title Lists

DVD-RAM DVD-RW DVD-R

1 With the unit in Stop mode, press the **QUICK** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ▶ button.


Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name

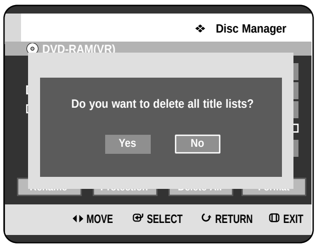
Used Space 00 : 11 : 56

Available Space 00 : 11 : 56 SP

Disc Protection Info Not Protected

3 Press the ◀ ▶ buttons to select **Delete All**, then press the **OK** button.

- You will be prompted with the confirmation message “Do you want to delete all title lists?”.


Disc Manager
DVD-RAM(VR)
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete all title lists?

- When Protected Entry exists: The Delete All Title List function will not operate. If there is a title containing a still picture, the function will not operate.
  If you want to delete a protected entry, disable Protect on the Lock item.
- When a protected DVD-RAM is used, data cannot be deleted from a disc.

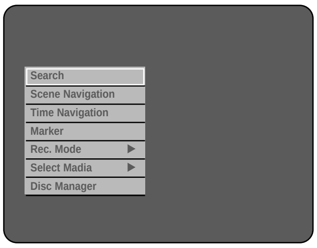
4 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
All title lists are deleted.

Finalising a Disc

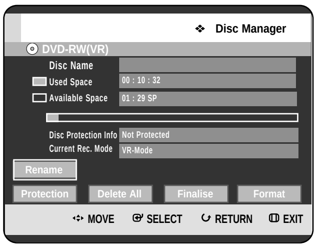
After you have recorded the titles onto a DVD-RW/DVD-R disc with your HDD & DVD RECORDER, it needs to be finalised before it can be played back on external devices.

DVD-RW DVD-R

1 With the unit in Stop mode, press the **QUICK** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ▶ button.


Disc Manager

DVD-RW(VR)

Disc Name

Used Space 00 : 10 : 32

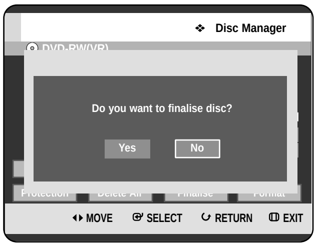
Available Space 01 : 29 SP

Disc Protection Info Not Protected

Current Rec. Mode VR-Mode

Rename
Protection
Delete All
Finalise
Format
MOVE
SELECT
RETURN
EXIT

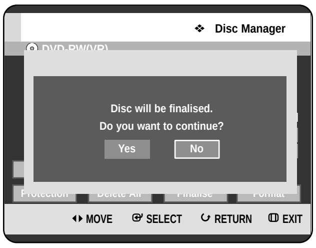
3 Press the ▲▼ ◀ ▶ buttons to select **Finalise**, then press the **OK** button.
You will be prompted with the message “Do you want to finalise disc?”.


Disc Manager

Do you want to finalise disc?

Yes
No
MOVE
SELECT
RETURN
EXIT

If you select **Yes**, you will be prompted again with the message “Disc will be finalised. Do you want to continue?”.


Disc Manager

Disc will be finalised.
Do you want to continue?

Yes
No
MOVE
SELECT
RETURN
EXIT

4 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
The disc is finalised.

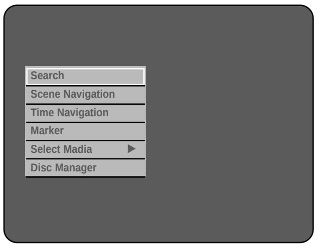
NOTE

- Once a disc is finalised, you cannot delete entries from the record list.
- After being finalised, the DVD-R/DVD-RW(video mode) operates in the same manner as a DVD-Video.
- Depending on the disc type, the displayed screen may be different.
- Finalising time may be different depending on the amount of data recorded on the disc.
- Data on the disc can be damaged if the recorder is powered off during finalise process.
- When the disc contains a music or JPEG files, you cannot finalise the disc.

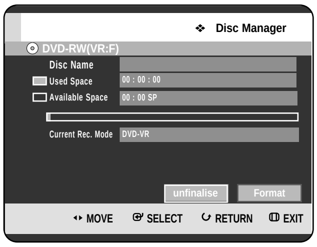
Unfinalising a Disc (V/VR mode)

DVD-RW

1 With the unit in Stop mode, press the **QUICK** button.


Search
Scene Navigation
Time Navigation
Marker
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **OK** or ▶ button.


Disc Manager

DVD-RW(VR:F)

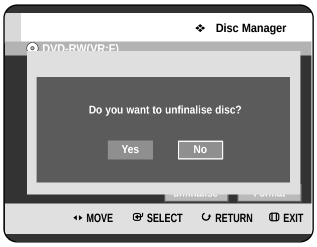
Disc Name

Used Space 00 : 00 : 00

Available Space 00 : 00 SP

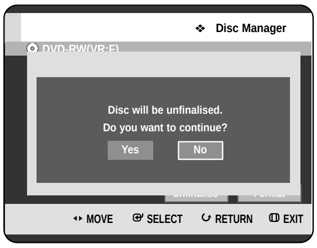
Current Rec. Mode DVD-VR
unfinalise
Format
MOVE
SELECT
RETURN
EXIT

3 Press the ◀ ▶ buttons to select **Unfinalise**, then press the **OK** button.
You will be prompted with the message “Do you want to unfinalise disc?”.


Disc Manager

Do you want to unfinalise disc?
Yes
No
MOVE
SELECT
RETURN
EXIT

If you select **Yes**, you will be prompted again with the message “Disc will be unfinalised. Do you want to continue?”.


Disc Manager

Disc will be unfinalised.
Do you want to continue?
Yes
No
MOVE
SELECT
RETURN
EXIT

4 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
The disc is unfinalised.

NOTE

- A DVD-RW can be finalised or unfinalised in Video mode.

	Finalise	Unfinalise
Mark	DVD-Video(RW)	DVD-RW(V)
Operation	Same as DVD-Video	Additional recording, protection and deletion are possible.

- A DVD-RW can be finalised or unfinalised in VR mode.

	Finalise	Unfinalise
Mark	DVD-RW(VR:F)	DVD-RW(VR)
Operation	Additional recording, deletion, editing, and protection are impossible.	Additional recording, deletion, editing, and protection are possible.

MEMO

13. Circuit Operating Descriptions

13-1 Power

13-1-1 About S.M.P.S (Ringing Choke Converter method)

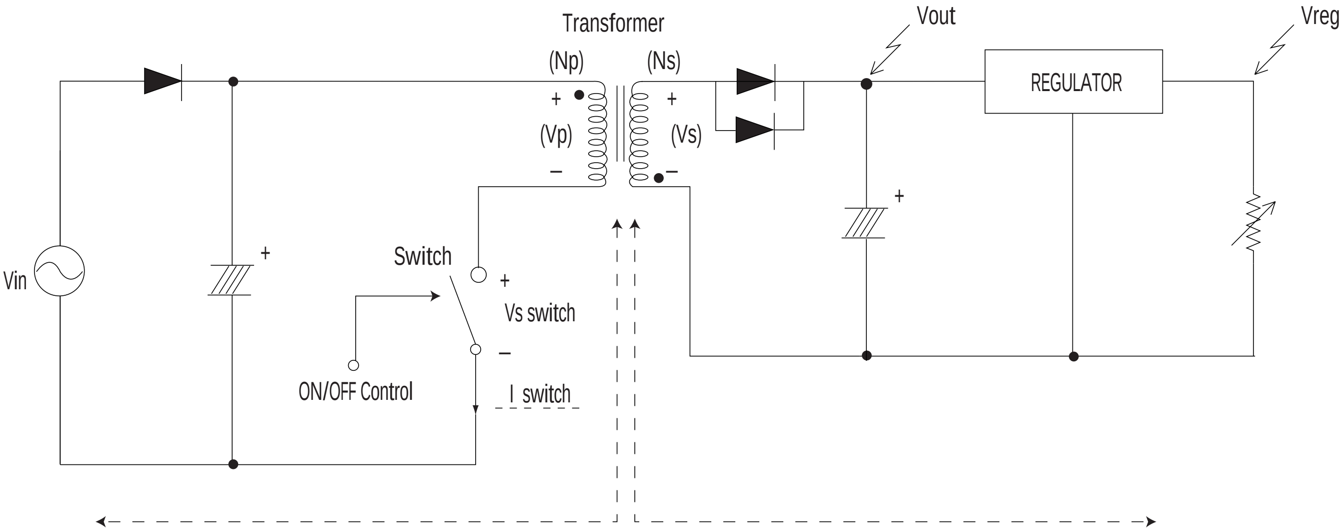

Transformer
(Np)
(Ns)
+
(Vp)
−
+
(Vs)
−
Vout
Vreg
REGULATOR
+
+
Vin
Switch
+
Vs switch
−
ON/OFF Control
I switch

Fig. 13-1

◆ Terms

1) 1st : Common power input to 1st winding.
2) 2nd : Circuit followings output winding of transformer.
3) f (Frequency) : Switching frequency (T : Switching cycle)
4) Duty : (Ton/T) x 100

13-1-2 Circuit description [FLY-Back RCC(Ringing Choke Converter)] Control

(a) AC Power Rectification/Smoothing Terminal

1) PADT1 : Convert AC power to DC (Wave rectification).
2) PRCU1 : Smooth the voltage converted to DC.
3) PALT1, PALT2, PACT1, PACT2 : Noise removal at power input/output.
4) PLRU1 : Rush current limit resistance at the momemt of power cord insertion.
   · Without PLRU1, the bridge diode might be damaged as the rush current increases.

(b) SNUBBER Circuit : PSRZ1, PSRZ2, PSCX1, PSCZ2, PSDZ1

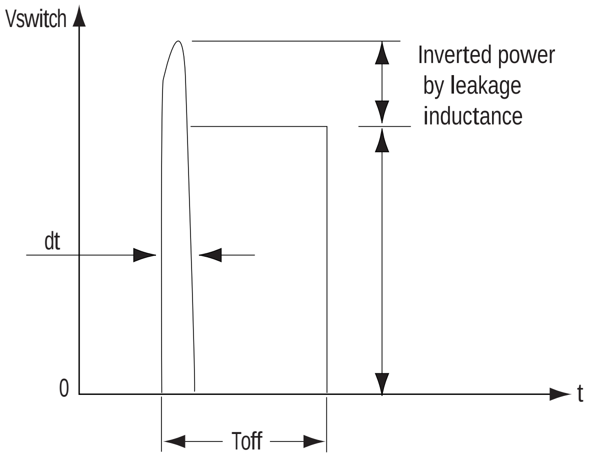


Fig. 13-2

1) Prevent residual high voltage at the terminals of switch during switch off/Suppress noise.
High inverted power occurs at switch off, because of the 1st winding of transformer :
(V=-L1 xdi/dt. L1 : Leakage Induction)
A very high residual voltage exist on both terminals of PQQX1 because dt is a very short.

2) SNUBBER circuit protects PQQX1 from damage through leakage voltage suppression by RC, (Charges the leakage voltage to PSDZ1 and PSCX1 and discharges to PSRZ1, PSRZ2).
3) PPCF2 : For noise removal

(c) PQIZ1 Vcc circuit

1) PVRL1, PVRL2, PVRL3 : PQIZ1 driving resistance (PQIZ1 works through driving resistance at power cord in)
2) PQIZ1 Vcc : PVRL4, PVDL1, PVCL1
   ① Use the output of transformer as Vcc,because the current starts to flow into transformer while PQIZ1 is active
   ② Rectify to PVDL1 and smooth to PVCL1.
   ③ Use the output of transformer as PQIZ1 Vcc : The loads are different before and after PQIZ1 driving. (Vcc of PQIZ1 decreases below OFF voltage , using only the resistance dut to lode increase after PQIZ1 driving.)

(d) Feedback Control Circuit

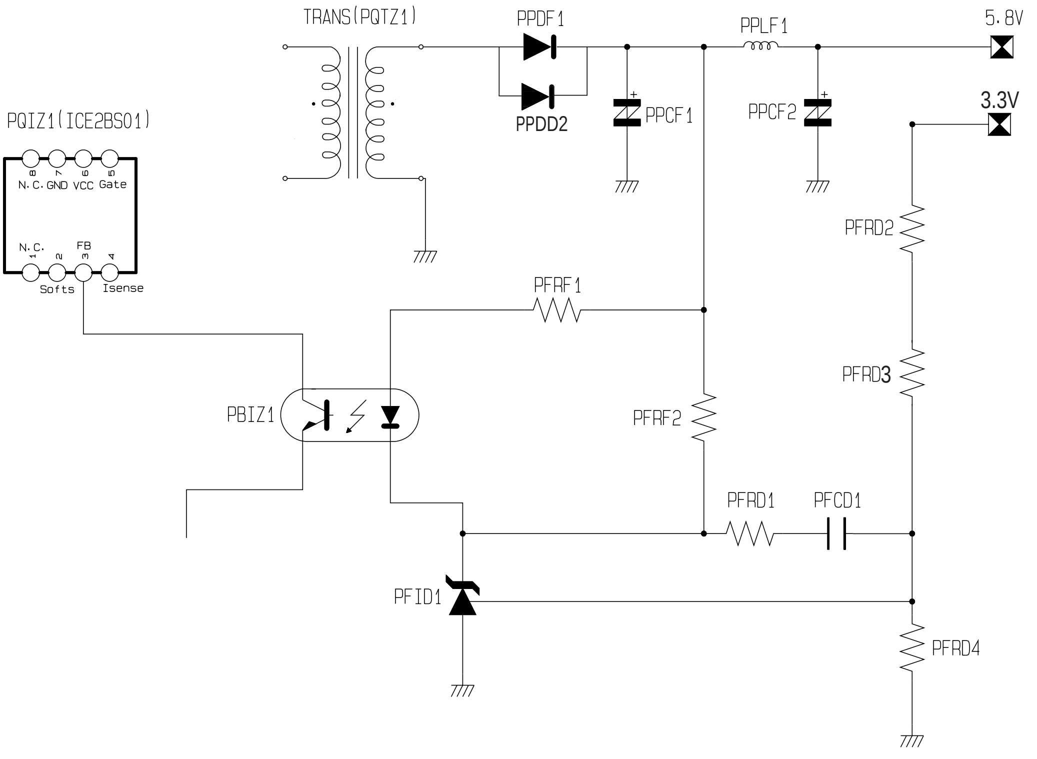

TRANS(PQTZ1)
PPDF1
PPLF1
5.8V
3.3V
PPDD2
PPCF1
PPCF2
PQIZ1(ICE2BS01)
8 7 6 5
N.C. GND VCC Gate
N.C. FB
1 2 3 4
Softs Isense
PFRD2
PFRF1
PFRD3
PBIZ1
PFRF2
PFRD1
PFCD1
PFID1
PFRD4

Fig. 13-3

1) F/B terminal of PQIZ1 determines output duty cyle.
2) C-E (Collector-Emitter) of PQIZ1 and F/B potential of PQIZ1 are same.

13-1-3 Internal Block Diagram (Internal Block Diagram of S.M.P.S. Circuit)

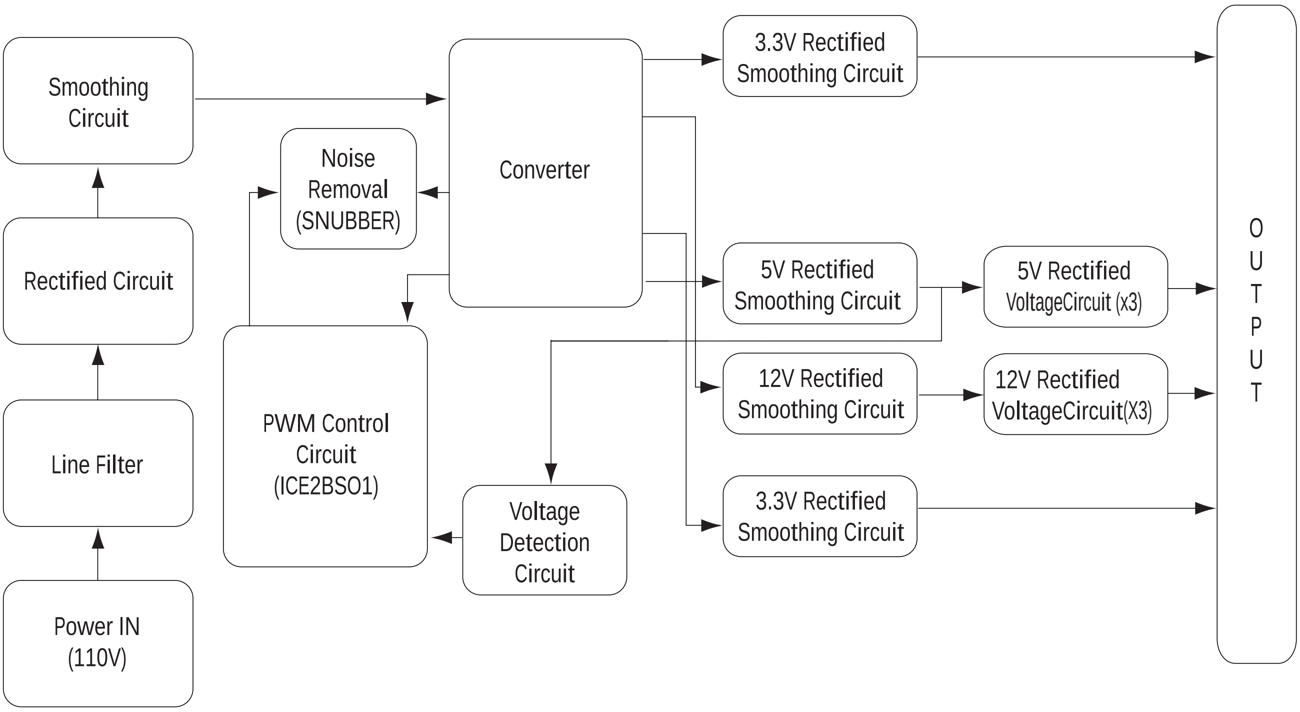

Smoothing Circuit
Rectified Circuit
Line Filter
Power IN (110V)
Noise Removal (SNUBBER)
Converter
PWM Control Circuit (ICE2BSO1)
Voltage Detection Circuit
3.3V Rectified Smoothing Circuit
5V Rectified Smoothing Circuit
5V Rectified VoltageCircuit (x3)
12V Rectified Smoothing Circuit
12V Rectified VoltageCircuit(X3)
3.3V Rectified Smoothing Circuit
OUTPUT

Fig. 13-4

13-2 AV Codec

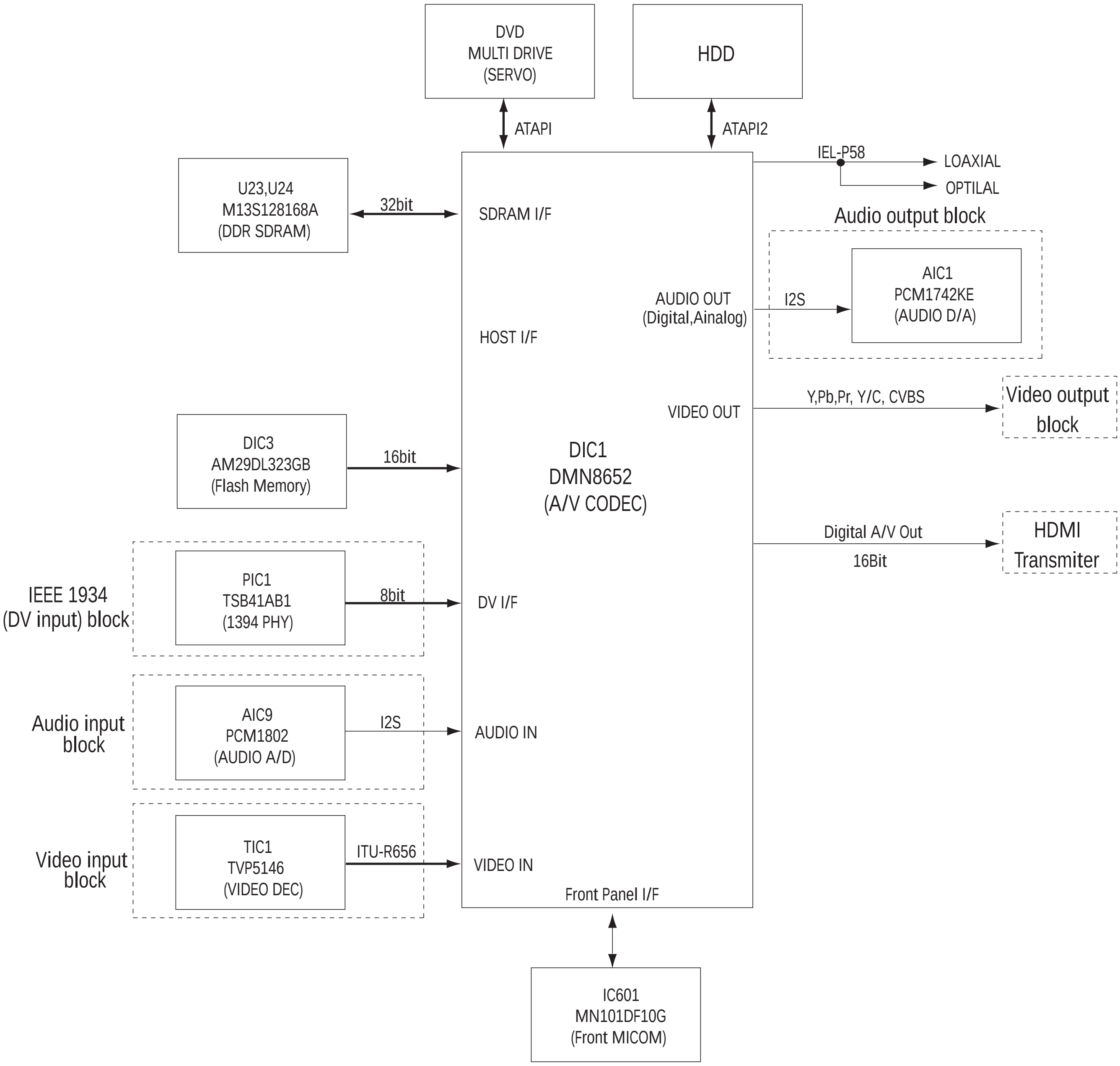

DVD
MULTI DRIVE
(SERVO)
HDD
ATAPI
ATAPI2
IEL-P58
LOAXIAL
OPTILAL
U23,U24
M13S128168A
(DDR SDRAM)
32bit
SDRAM I/F
Audio output block
AIC1
PCM1742KE
(AUDIO D/A)
AUDIO OUT
(Digital,Ainalog)
I2S
HOST I/F
VIDEO OUT
Y,Pb,Pr, Y/C, CVBS
Video output block
DIC3
AM29DL323GB
(Flash Memory)
16bit
DIC1
DMN8652
(A/V CODEC)
Digital A/V Out
16Bit
HDMI
Transmiter
IEEE 1934
(DV input) block
PIC1
TSB41AB1
(1394 PHY)
8bit
DV I/F
Audio input block
AIC9
PCM1802
(AUDIO A/D)
I2S
AUDIO IN
Video input block
TIC1
TVP5146
(VIDEO DEC)
ITU-R656
VIDEO IN
Front Panel I/F
IC601
MN101DF10G
(Front MICOM)

Fig. 13-5

· Main system control
· A/V Encoding/Decoding
· Transcoding/rating
· IEEE 1394 link layer function
· ATAPI interface with DVD-Multi Drive
· Analog Progressive/interlaced video output

13-2-1 DIC1 Processor Internal Architecture Diagram

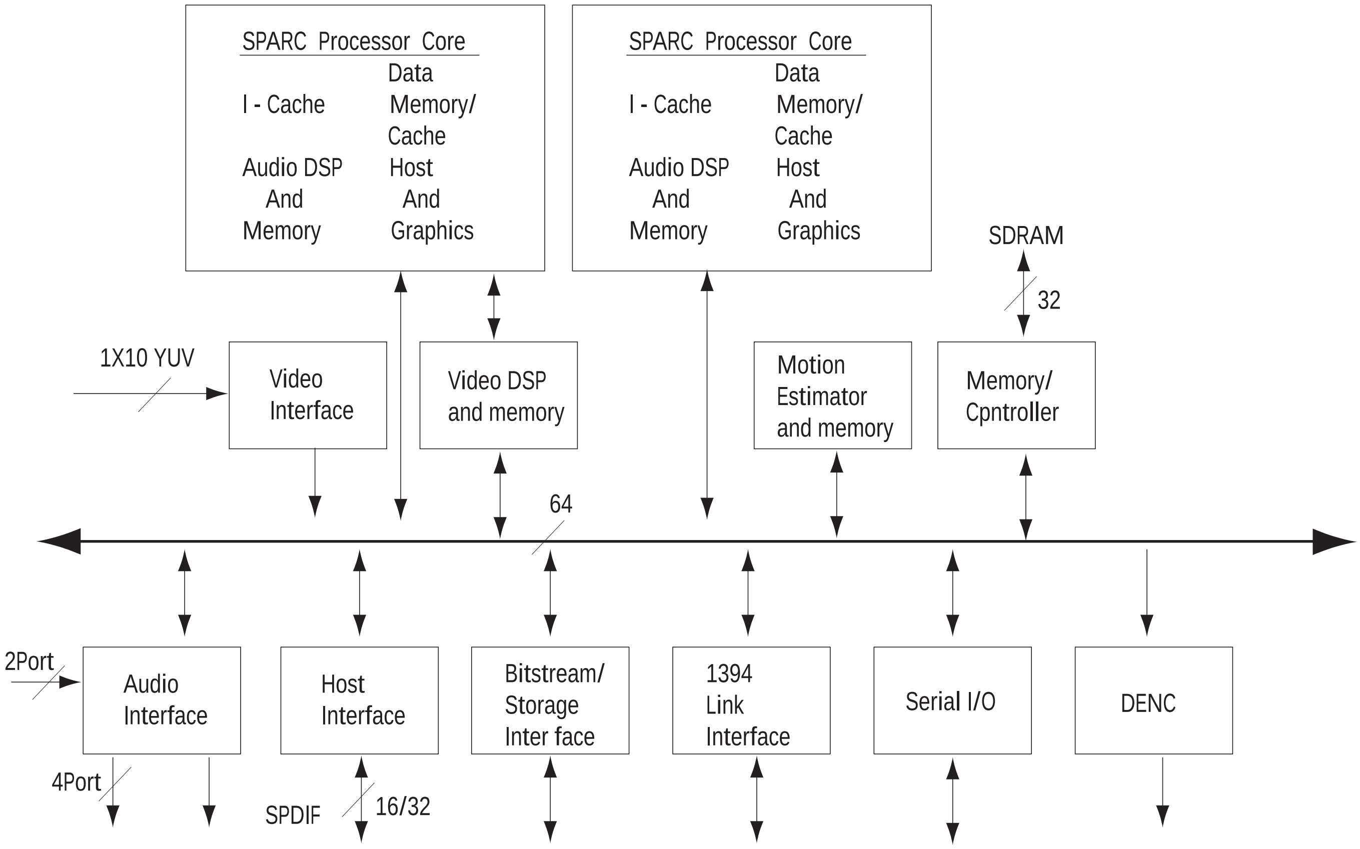

SPARC Processor Core
I - Cache
Data Memory/ Cache
Audio DSP And Memory
Host And Graphics
SPARC Processor Core
I - Cache
Data Memory/ Cache
Audio DSP And Memory
Host And Graphics
SDRAM
32
1X10 YUV
Video Interface
Video DSP and memory
Motion Estimator and memory
Memory/ Cpntroller
64
2Port
Audio Interface
Host Interface
Bitstream/ Storage Inter face
1394 Link Interface
Serial I/O
DENC
4Port
SPDIF
16/32

Fig. 13-6

13-2-2 A/V Processor (DIC1) Functional description

1) SPARC Processors

Two 32-bit SPARC processors, one dedicated to video processing and the other assigned general system tasks and audio processing, perform three classes of functions: system processing, audio processing, and high-level control flow and decision-making tasks for video processing. Optionally, they can also perform 2D graphics and host functions.

The DMN8602 also support multiple video inputs, windowed video ad graphics with arbitrarily relocatable and resizable windows, letterbox, and side-by-side display of SD sources.

2) Host Interface

The host communication functions include initializing the DMN-8652 device, downloading software to the local SDRAM, sending commands, monitoring status, and downloading graphics data such as OSD bitmap.

3) Bitstream/Storage interface

◆ ATAPI Controller

ATAPI is an asynchronous, 120ns, 16-bit word interface commonly used to connect devices such as hard disks, CD/DVD ROMs, and DVD RAMs. All operations are initiated by reading/writing a set of ATAPI device registers through programmed input/output(PIO) data transfer. ATAPI has DMA commands for transferring long data. The ATAPI register address is defined by the output pins CS0, CS1, DA[2:0].

◆ The IEEE1394 interface can receive MPEG-2 transport stream or DV stream data contained in isochronous packets (IPs). The DMN-8652 device filters the packets by matching channel IDs. In the case of MPEG-2 transport streams, the DMN-8652 device performs descrambling on the data that is scrambled with 5C encryption. Software is responsible for transport section processing and demultiplexing.

4) Video Interface

◆ Video Input channel

The video input channel captures ITU-R BT.656-compliant 10-bit digital YUV component video stream from Video decoder chip(TIC1)

◆ Video Digital Encoder (DENC)

The NTSC/PAL digital video encoder (DENC) module converts a digital video data stream into NTSC or PAL composite or component video output.

The DMN-8652 DENC output can be in one of the following formats:

- Baseband composite NTSC (M) or PAL (B,D,G,H,I) analog video.
- Separate analog luma(Y) and chroma(C) output to support S-Video.
- Separate analog component video RGB or SMPTE YPbPr output.

5) Audio Interface

The serial audio input port receives uncompressed 16- to 24-bit serial digital audio data from external audio ADC(AIC9). An internally generated clock provides bit serial clocking of the data coming from external ADC
The serial audio output port sends uncompressed 16- to 24-bit serial digital audio data to external audio DAC(AIC1). An internally generated clock provides bit serial clocking of the data coming from external ADC

6) Serial I/O interface

◆ SPI interface

The SPI(Serial Peripheral Interface) port provides a bus for a serial interface with front panel micom(FIC1)

◆ IDC interface

The IDC bus is a simple, two-wire, bidirectional communication bus. The two signals, clock and data, are common to every device connected to the bus.

In this system, IDC bus is connected to EEPROM(DIC8) and Video Decoder(TIC1)

13-3 SERVO (DVP Multi Drive)

1) Pick-Up

Data in the disc is processed from the optical pick-up unit (OPU). OPU includes the Elantec chip (EL6912c) which is a highly integrated laser diode driver designed to support multi-standard writable optical drives. This chip also has an IV amplifier with concurrent read and write sampling. The architecture allows reprogramming of the timers to support different media DVD or CD standards, and different speed.

2) A-Chip

A chip is RF processor. This module performs RF signal processing which includes RFIP, RFIN, AGC, RF equalizer. This processor is able to detect tracking error, focus error and various signals such as CE, PE, SBAD, DEFECT, BCA, MIRROR, Wobble, TZC, RC, and RECD.

3) C-Chip

C-Chip is composed of DP1, PRML and WS.

First, the Data processor1 (DP1) performs EFM/EFM+ Demodulation and data is stored in the buffer memory in data processor2 (DP2). DVD data in this buffer is transferred to CSS/ATAPI through error-correction code

(ECC), descramble process and error detection code (EDC).

Second, WS performs the following processes.

① Delay compensation using Shift register
② Sample/Hold pulse generation
③ I/V Gain Control
④ Providing clock for RF chip
⑤ OPC Control signal generation

Lastly, PRML completes the adaptive EQ/VD and Digital PLL.

4) D-Chip

D-Chip consists of Servo DSP, DP2 and 1Mbit memory. Servo DSP is dealing with controlling the servo-mechanism in DVD recorder. Servo-DSP has the following features.

① Bulit-in 10Bit ADC(8ch), DAC(3ch) and PWM(7ch)
② Step Motor Control Logic: Macro/Micro Step
③ Track Counter: long distance velocity control direct seek
④ Shock/Defect detection
⑤ Header (DVD-RAM)/Land Pre-Pit (DVD-R/RW) Detection
⑥ Several Servo Monitor Signal Detection
⑦ RF IC Interface
⑧ Micom Interface
⑨ Digital Servo Control of focus, tracking, sled and seek
⑩ Disc Auto-Detection
⑪ Automatic Adjustment of the offset, balance and gain of Focus and Tracking Signal
⑫ Direct Seek with Velocity Control
⑬ Step Motor Control: Macro Seek
⑭ De-Track and Lens Shift Detection and Compensation
⑮ Center Error Control
⑯ DVD Layer Jump
⑰ Tilt Detect and Compensation

DP2 performs High Speed ECC and CD DA Decoder.

5) ATAPI Controller

ATAPI (ATA Packet Interface) the standard interface protocol used to connect the CD/DVD Drive to IDE inter face. Data from the front-end is processed to back-end through this ATAPI protocol. Sanyo chip (LC98600CT-XB0) is utilized for ATAPI interface. LC98600CT-XB0 has the following features.

① ECC and EDC correction/addition for CD-ROM data
② Subcode decoding/encoding
③ Spindle servo control
④ CLV/CAV servo control using ATIP data
⑤ ATIP decoding and CRC check functions
⑥ Providing random EFM output for PCA use
⑦ High-accuracy write strategy signal output enabled (CD-R 52x)
⑧ Buffer RAM can be accessed by the microcontroller through the LC98600CT-XB0
⑨ Built-in ATA-PI(IDE) interface (supports Ultra DMA modes 0,1, and 2)
⑩ 52x decoding speed/52x encoding speed supported with 33.8688Mhz
⑪ Maximum transfer speed PIO mode: 16.6 MB/s (with IORDY), Ultra-DMA: 66MB/s (with DMARQ)
⑫ User can freely set the CD main channel, C2 flag, and subcode areas in buffer RAM
⑬ Built-in batch transfer function for transferring (CD main channel, C2 flag, etc., in a single operation)
⑭ Built-in multi-transfer function (allows multiple blocks to be sent to the host automatically in a single operation)

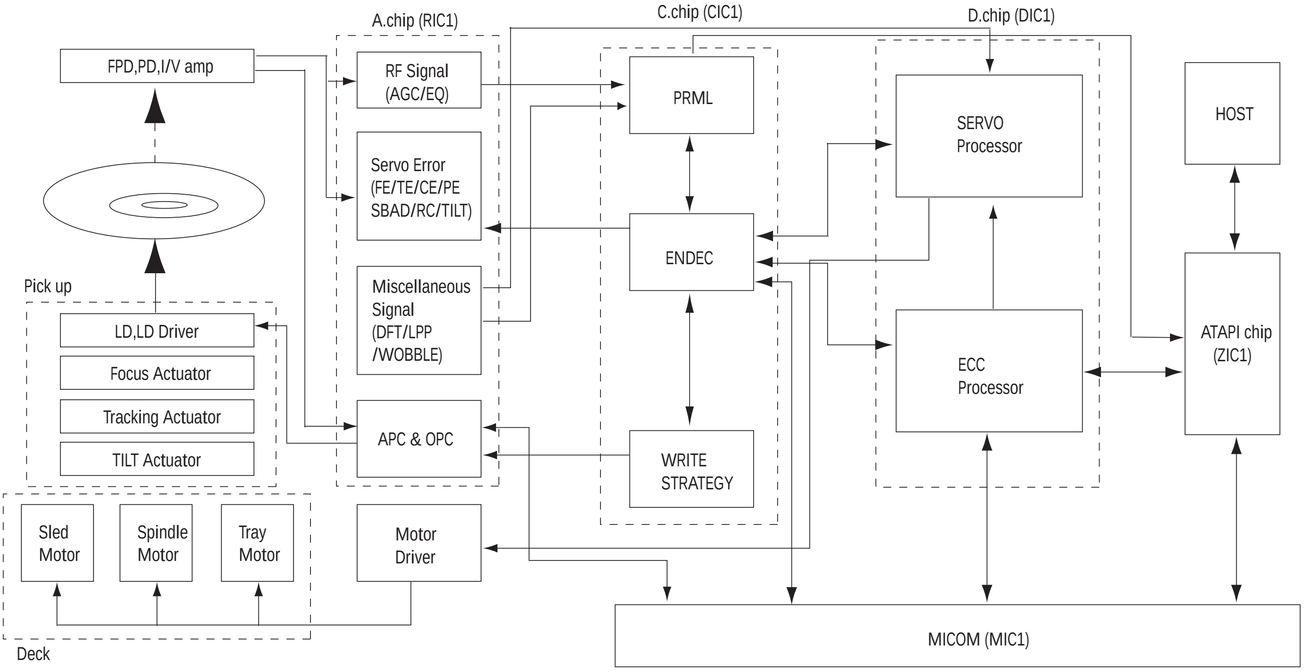

A.chip (RIC1)
C.chip (CIC1)
D.chip (DIC1)
FPD,PD,I/V amp
RF Signal (AGC/EQ)
PRML
SERVO Processor
HOST
Servo Error (FE/TE/CE/PE SBAD/RC/TILT)
ENDEC
Pick up
Miscellaneous Signal (DFT/LPP /WOBBLE)
LD,LD Driver
Focus Actuator
Tracking Actuator
TILT Actuator
ATAPI chip (ZIC1)
ECC Processor
APC & OPC
WRITE STRATEGY
Sled Motor
Spindle Motor
Tray Motor
Motor Driver
Deck
MICOM (MIC1)

Fig. 13-7

13-4 Video In/out Block

DVD-HR725 has the two single CVBS Video input(AV3) and two Scart input from AV1 or AV2.
AV3 Video input is CVBS at the at the Front Panel. AV2 Scart has CVBS & RGB input and CVBS output, AV1 Scart is vice versa at the Rear Panel.
 The analog Video signal is selected by the IC201(BU4051 Mux). It is controlled by FIC1 (Front Micom).
 TIC1 (Video Decoder) diverges from the 14.318185MHz crystal, then generates ITU-R656 (10bits) and 27MHz clock.
 TIC1 (Video Decoder) does closed caption, copy guard detect processing and A/D conversion of analog Video signal converted into 11bit Digital Video signal (ITU-R656 Format) is outputted via DIC1 (MPEG2 Decoder & Encoder with video Encoder) of digital part.

13-4-1 Outline

DIC1 (MPEG2 Decoder & Encoder with video Encoder) diverges from the 13.5MHz crystal, then generates VSYNC and HSYNC.
 DIC1 (MPEG2 Decoder & Encoder with video Encoder) does RGB encoding, copy guard processing and D/Aconversion of 10bit Video signal converted into analog signal is outputted via amplifer of analog part.
DIC1 inputted from pin E1 with 13.5MHz generates HSYNC and VSYNC which are based on video signal. DIC1 is synchronous signals with decoded video signal.
 The above signals, which are CVBS (Composite Video Burst Synchronized), Y(S_Video), C(S_Video),Y(Component)/G(Green), Cr(component)/R(Red), Cb(component)/B(Blue), are selectively outputted 576i(interlaced Video Output), 576P(progressive Video Output).
DIC1 adopts 10bit D/A converter. DIC1 perform video en-coding as well as copy protection.

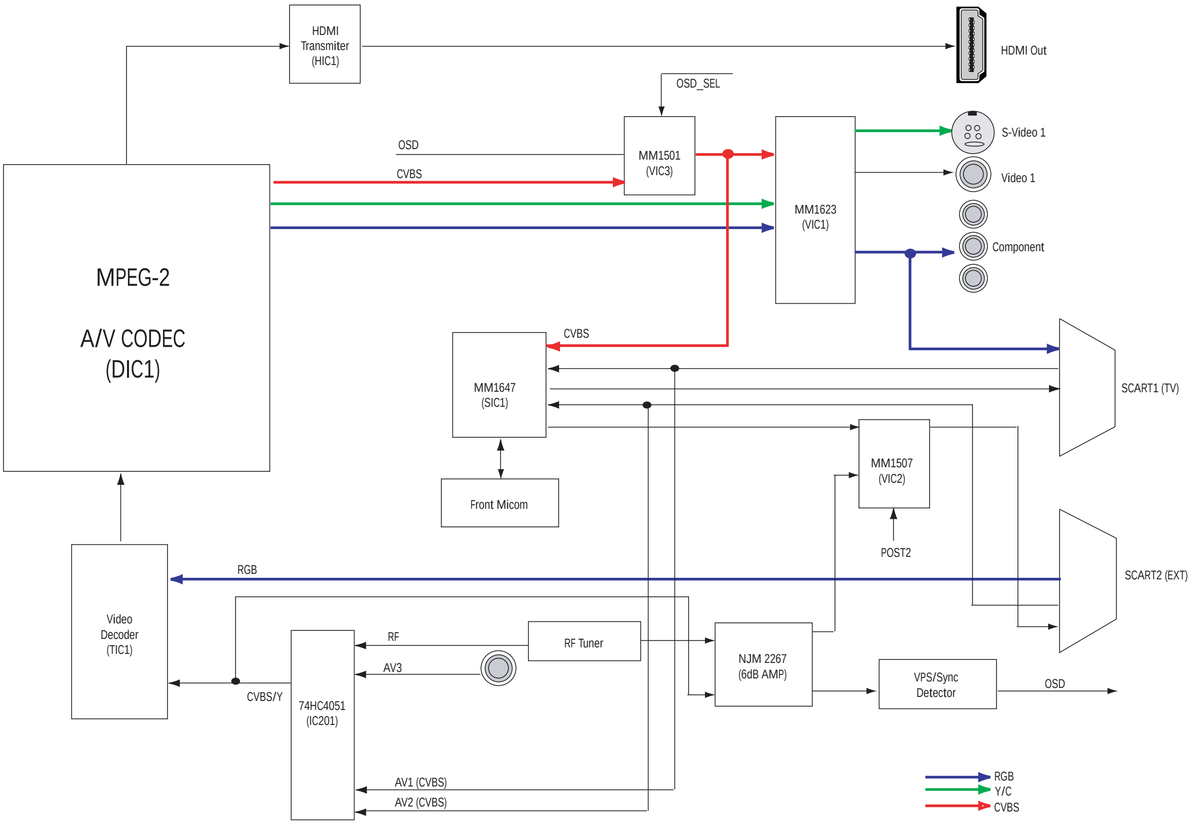

HDMI Transmiter (HIC1)
HDMI Out
OSD_SEL
OSD
CVBS
MM1501 (VIC3)
MM1623 (VIC1)
S-Video 1
Video 1
Component
MPEG-2
A/V CODEC (DIC1)
CVBS
MM1647 (SIC1)
SCART1 (TV)
MM1507 (VIC2)
Front Micom
POST2
SCART2 (EXT)
RGB
Video Decoder (TIC1)
RF
RF Tuner
AV3
NJM 2267 (6dB AMP)
CVBS/Y
74HC4051 (IC201)
VPS/Sync Detector
OSD
AV1 (CVBS)
AV2 (CVBS)
RGB
Y/C
CVBS

Fig. 13-8

13-4-2 Video Switch (MM1507:VIC2,MM1501:VIC3)

MM1501, 1507 is 2by1 Video switch and VIC2 is switched by Pin15 of SIC1. It selects from RF Video signal via TIC2(NJM2267) for Decoder CH. or normal video output via SIC1.
VIC3 is switched by Pin23 of FIC1. It selects Video Output from DIC1 or OSD SCREEN for Optional setting.

13-4-3 Analog Mux (BU4051, MM1501)

IC201(BU4051) and IC202(MM1501) are Analog Mux.
As input selecttion Pin(9, 10, 11) of the IC201 are controlled by the Front Micom, IC201 select among AV1 CVBS, AV2 CVBS, AV3 CVBS, RF CVBS signal.

13-4-4 MUX IC for 2SCART (MM1647)

SIC1(MM1647) is Audio & Video switcher with I2C bus for Two SCART. I2C bus is connected with FIC1(Front micom) and be control Pin 30 for AV1 CVBS OUTPUT is selected from pin5, pin28.
Pin 29 for AV2 CVBS OUTPUT is selected from pin5, pin3.

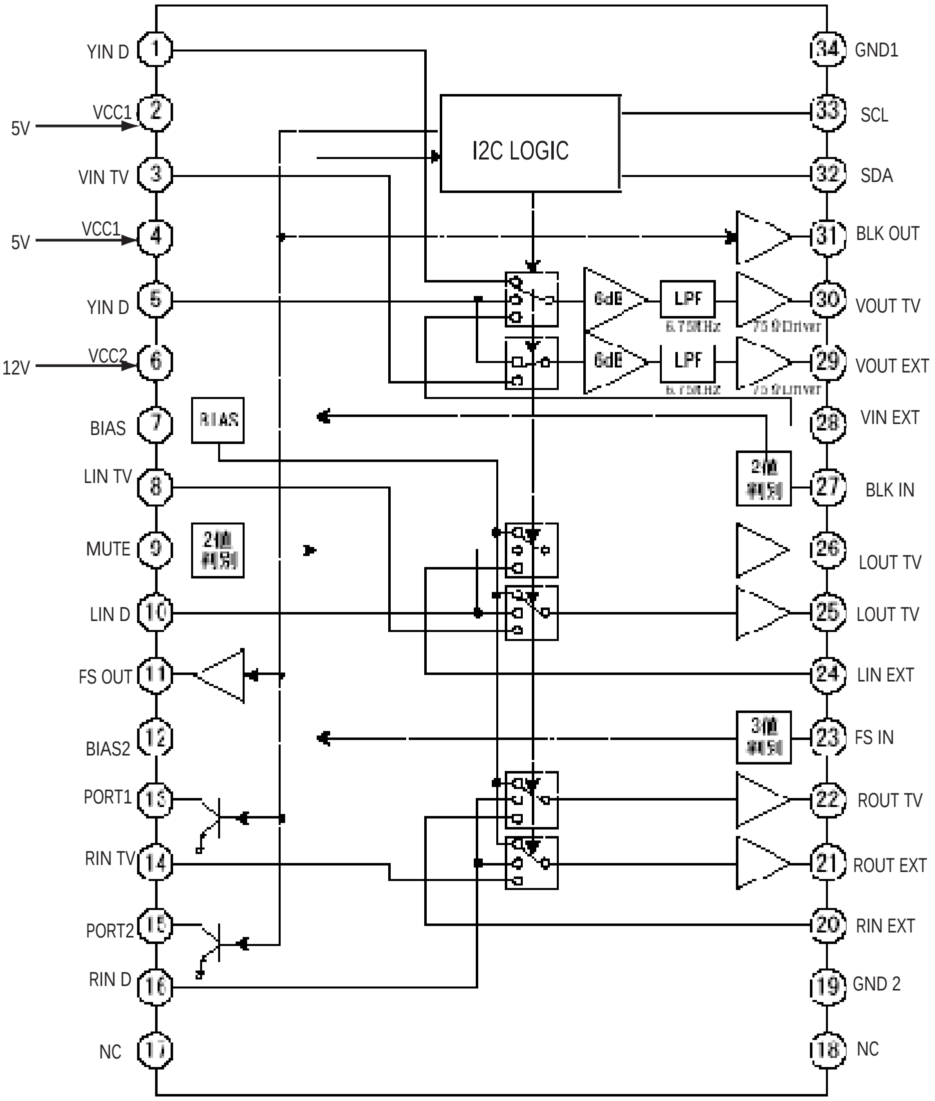

YIN D 1
5V
VCC1 2
VIN TV 3
5V
VCC1 4
YIN D 5
12V
VCC2 6
BIAS 7
LIN TV 8
MUTE 9
LIN D 10
FS OUT 11
BIAS2 12
PORT1 13
RIN TV 14
PORT2 15
RIN D 16
NC 17
34 GND1
33 SCL
32 SDA
31 BLK OUT
30 VOUT TV
29 VOUT EXT
28 VIN EXT
27 BLK IN
26 LOUT TV
25 LOUT TV
24 LIN EXT
23 FS IN
22 ROUT TV
21 ROUT EXT
20 RIN EXT
19 GND 2
18 NC
I2C LOGIC
BIAS
2値判別
3値判別
6dB
LPF
6.75MHz
75Ω Driver

Fig. 13-9

13-4-5 NTSC/PAL Video Decoder (TVP5146 : Video Decoder)

The TIC1 (Video Decoder : TVP5146) device is a high quality, single-chip digital video decoder that digitizes and decodes all popular baseband analog video formats into digital component video. The TIC1 (Video Decoder :TVP5146) supports the analog-to-digital (A/D) conversion of component RGB and YPbPr signals, as well as the A/D conversion and decoding of NTSC, PAL and SECAM composite and S-video into component YCbCr.
This TIC1 (Video Decoder : TVP5146) includes four 10-bit 30-MSPS A/D converters. and A/D conversion of 10bit analog Video signal converted into Digital Video signal (ITU-R656 Format) is outputted via DIC1 (MPEG2 Decoder & Encoder with video Encoder) of digital part.
The following output formats supply 10-bit 4:2:2 YCbCr to the DIC1 (MPEG2 Decoder & Encoder with video Encoder) of digital part.
On CVBS and S-video inputs, the user can control video characteristics such as contrast, Brightness, saturation, and hue via an I2C DIC1 port [PIN V17, V18] interface.
The TVP5146 decoder includes methods for advanced vertical blanking interval (VBI) data retrieval. The VBI data processor (VDP) slices, parses, and performs error checking on teletext, closed caption (CC), Copy Guard Detect Processing and other VBI data.

13-4-6 Amplifier (MM1623)

VIC1 is 6dB amplifier.
Based on CVBS signal, the final output level must be 2Vpp without 75ohm terminal resistance.
Because the level of video encoder output is only 1Vpp, the level is adjusted with the special amplifier.
When mute of pin 3 is high active, if the pin is floating and connect to power, the output signal is never outputted.
CVBS, Y, C, Y(R), Cb(B), Cr(R) outputted from video encoder are inputted to VIC1 [Pin4, 6, 2, 10, 12, 14] respectively.
The signal to which gain is adjusted by amplifier is outputted from jack via 75ohm Resistance
(VR14, 15, 16, 23, 12, 13).

13-4-7 HDMI output (sil9190)

HIC1(SiI 9190) is the transmitters supporting the HDMI 1.0 (High Definition Multimedia Interface) secification.
These fully compliant devices provide a simple, low cost method of sending protected digital audio and video, providing end users with the first integrated all digital experience.
This device has compatibility with DVI 1.0 allows HDMI systems to connect to any DVI 1.0 display (DTV, plasma display, LCD TV, PC monitor).
The SiI 9190 incorporates an extremely flexible audio and video interface. An integrated color space converter allows direct connection to all major MPEG decoders including DVD MPEG decoders that provide only an ITU.656 output. An industry standard S/PDIF input accepts PCM encoded data as well as Dolby Digital, DTS and other formats capable of being sent over S/PDIF.
The Sil9190 is controlled by I2C line connected with DMN8652. HDMI output supports only 576p resolution mode in this model.

13-5 Audio

13-5-1 Audio Input Block

DVD-HR725 has three stereo line input terminals and internal TV-audio from RF Tuner Block.
These four analog audio signal source are converted to digital data by Input Block.
Input Block has Multiplexer(AIC51), Input Filter(AIC81, AIC82), and A/D Converter(AIC9).
The switching operation of AIC51 is controlled by FIC1(Front Micom) with I2C interface.

The signal selected by AIC51 are filtered by AIC81,AIC82.
The funtion of these OP-Amp is -6dB level scaling and second order Low Pass Filtering.
AIC9 is syncronized by three Digital clock from DIC1,
and output Digital signal to DIC1(Dolby Digital Encoder/Decoder).

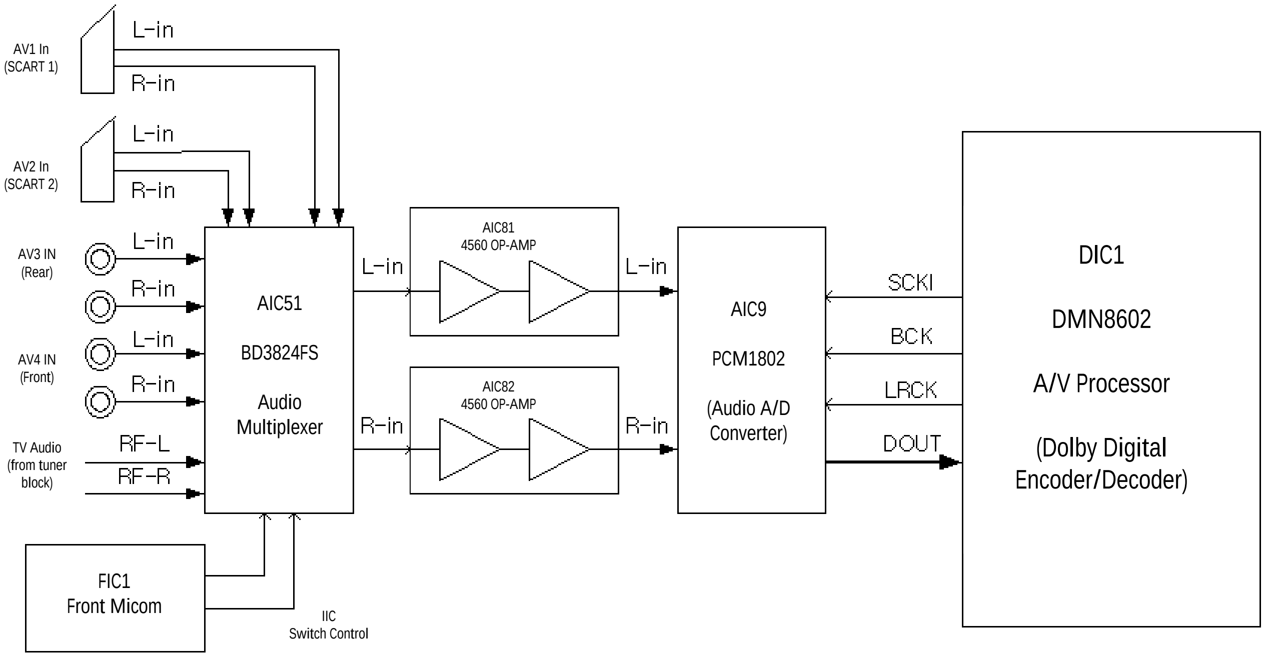

AV1 In (SCART 1)
L-in
R-in
AV2 In (SCART 2)
L-in
R-in
AV3 IN (Rear)
L-in
R-in
AV4 IN (Front)
L-in
R-in
TV Audio (from tuner block)
RF-L
RF-R
AIC51
BD3824FS
Audio Multiplexer
L-in
R-in
AIC81
4560 OP-AMP
AIC82
4560 OP-AMP
L-in
R-in
AIC9
PCM1802
(Audio A/D Converter)
SCKI
BCK
LRCK
DOUT
DIC1
DMN8602
A/V Processor
(Dolby Digital Encoder/Decoder)
FIC1
Front Micom
IIC
Switch Control

Fig. 13-10

13-5-2 Audio output Block

DVD-HR725 has four stereo analog line out terminal, and two digital output terminal.

Decoded signal by DIC1 is inputted to AIC1(D/A converter), then filtered and amplified by AIC4(OP-amp), and finally ouputted via RCA terminal and Scart terminal.

The Signal outputted via AV2 is equal to those of AV1(Scart), and RCA Analog ouput terminal in normal mode.

The Digital audio signal is drived by AIC3 inverter and ouputted via Optical(TOS-link) and Coaxial(S/PDIF) terminal.

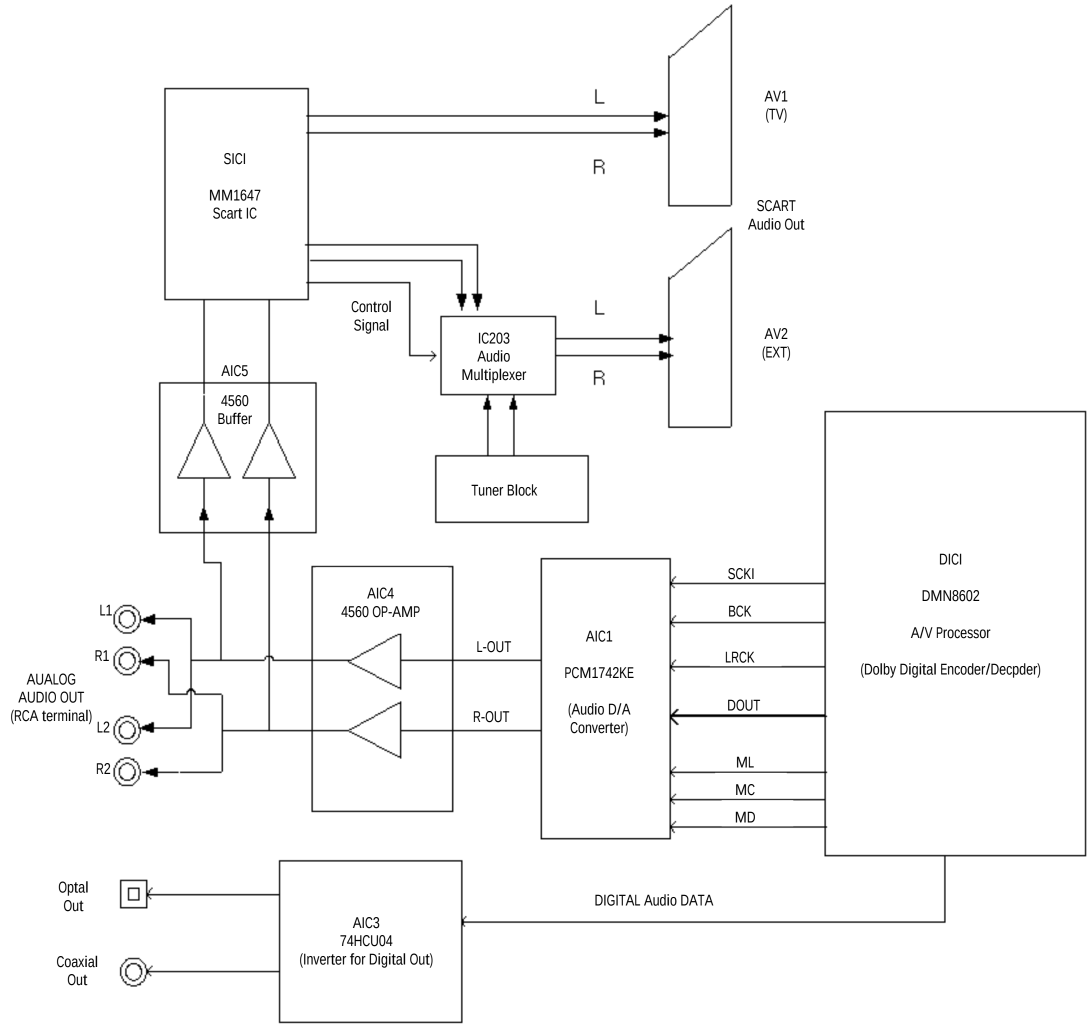

SICI
MM1647
Scart IC
L
R
AV1
(TV)
SCART
Audio Out
Control
Signal
IC203
Audio
Multiplexer
L
R
AV2
(EXT)
AIC5
4560
Buffer
Tuner Block
DICI
DMN8602
A/V Processor
(Dolby Digital Encoder/Decpder)
AIC4
4560 OP-AMP
L-OUT
R-OUT
AIC1
PCM1742KE
(Audio D/A
Converter)
SCKI
BCK
LRCK
DOUT
ML
MC
MD
L1
R1
L2
R2
AUALOG
AUDIO OUT
(RCA terminal)
Optal
Out
Coaxial
Out
AIC3
74HCU04
(Inverter for Digital Out)
DIGITAL Audio DATA

Fig. 13-11

13-6 Tuner

1) Low Pass Filter & High Pass Filter
   This consists of IF trap circuit and UHF & VHF separation circuit. If the input signal is IF (45.75MHz), this filter
   prevents interference.

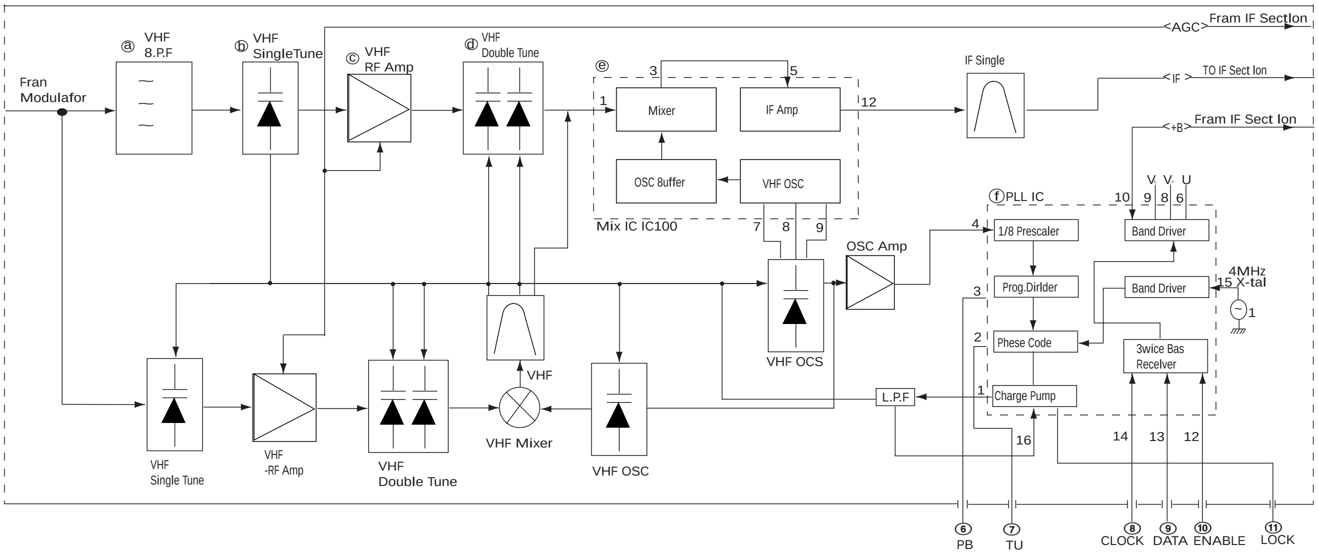
2) Single tune
   This consists of a filter circuit, RF AMF, impedance conversion circuit, image trap and a single tuning circuit. It prevents noise and other interference signals. It is very important part which improves NF (noise figure) and prevents the various of spurious signals.

3) RF AMF
   RF AMF is made of FET (Field Effects Transistor). It is controlled by AGC coming from IF DEMOD block.

4) Double tune
   It consists of a double tuning circuit to improve characteristic of rejection that results in a better band characteristic.

5) Mixer IC (Mixer, OSC, PLL)
   It consists a VHF and UHF OSC and Mixer circuit. We applied mixer to make better characteristic of rejection, it shows especially various beat characteristic.

6) PLL IC
   The PLL IC plays a role selection of Tuner channel. It was built-in three wire PLL IC, charge pump and band driver.
   The minimum of step frequency is 31.25KH z.



Fran Modulafor
ⓐ VHF 8.P.F
ⓑ VHF SingleTune
ⓒ VHF RF Amp
ⓓ VHF Double Tune
ⓔ
Mixer
IF Amp
OSC Buffer
VHF OSC
Mix IC IC100
1
3
5
12
7
8
9
IF Single
<AGC>
Fram IF Sectlon
<IF >
TO IF Sect Ion
<+B>
Fram IF Sect Ion
ⓕ PLL IC
1/8 Prescaler
Prog.Dirlder
Phese Code
Charge Pump
Band Driver
Band Driver
3wice Bas Recelver
4MHz
15 X-tal
V
V
U
10
9
8
6
4
3
2
1
16
14
13
12
OSC Amp
VHF OCS
L.P.F
VHF
VHF Single Tune
VHF -RF Amp
VHF Double Tune
VHF Mixer
VHF OSC
⑥ PB
⑦ TU
⑧ CLOCK
⑨ DATA
⑩ ENABLE
⑪ LOCK

Fig.13-12

13-7 IF

1) SAW FILTER
   It passes only needed band of the signal that is converted to IF frequency and decrease the others band to minimize the effect of adjacent channel.

2) RF AGC Control
   Used to determine RF AGC working point in tuner.

3) VCO Tank
   When VCO tank detects PLL, it makes the signal which sets a standard.

4) AFT (Auto Frequency Tuning)
   AFT automatically controls the oscillator frequency in the tuner, so that it retains a constant level.
   It is a quadrature detection type. The carrier, which is detected from video det is directly input to AFT.
   The 90 degree delayed phase signal is input at the same time to AFT and, the results come out.

5) IF AMP
   IF signal , which is selected in Saw filter, is amplified in IF amp frequency enough to be detected. The IF amp has parallel inputs & outputs structure.

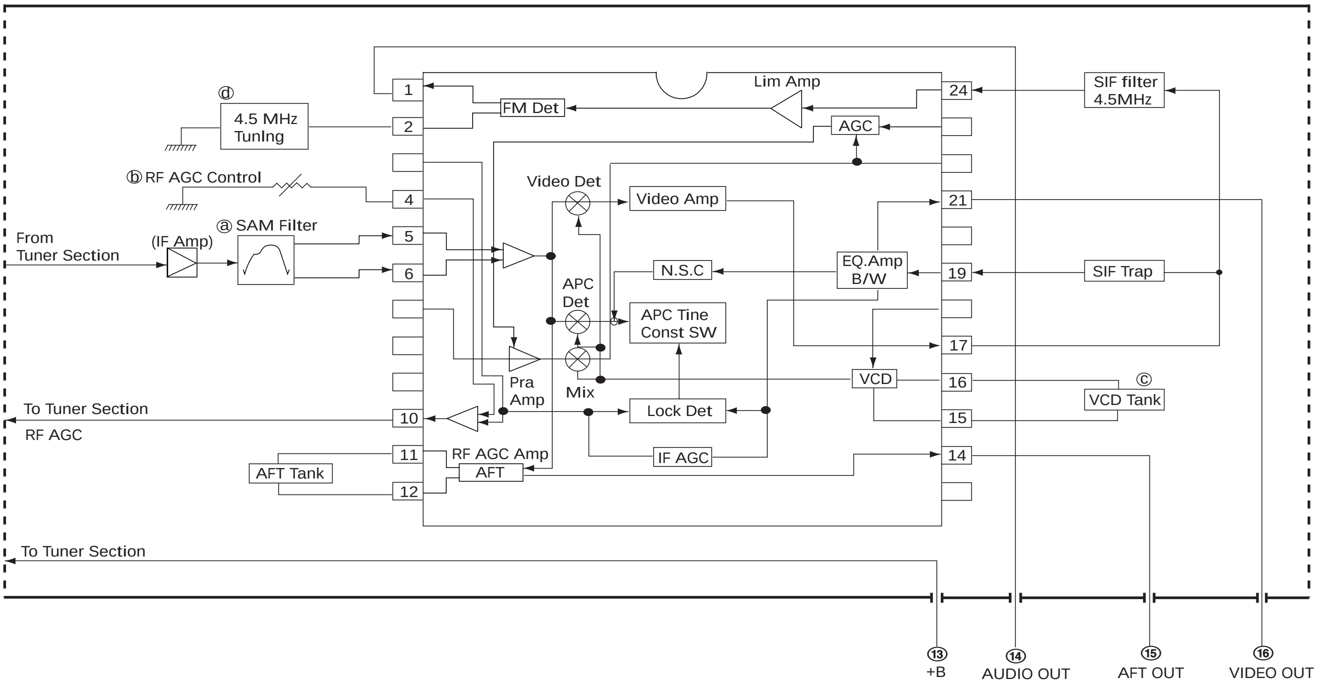

ⓓ
4.5 MHz Tuning
ⓑ RF AGC Control
ⓐ SAM Filter
From Tuner Section
(IF Amp)
To Tuner Section
RF AGC
AFT Tank
To Tuner Section
1
2
4
5
6
10
11
12
FM Det
Lim Amp
AGC
Video Det
Video Amp
N.S.C
APC Det
APC Tine Const SW
Pra Amp
Mix
Lock Det
RF AGC Amp
AFT
IF AGC
EQ.Amp B/W
VCD
24
21
19
17
16
15
14
SIF filter 4.5MHz
SIF Trap
ⓒ
VCD Tank
⑬ +B
⑭ AUDIO OUT
⑮ AFT OUT
⑯ VIDEO OUT

Fig. 13-13

MEMO

14. Reference Information

14-1 Introduction to DVD

14-1-1 The Definition of DVD

DVD is the next generation medium and is the acronym of the Digital Versatile Disc or thr Digital Video Disc, which maximizes the saving density of the disk surface using the MPEG-2 compression technology to enable the storage of 17G bytes of data on the same size CD.

1) 7 times the storage capacity of the conventional CD

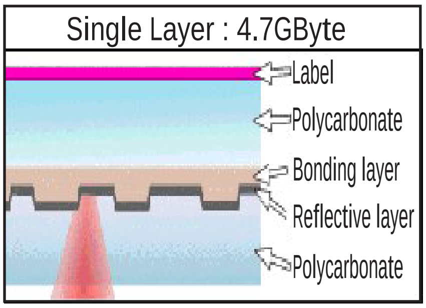
- Minimized the track pitch and pit size to 1/2 of conventional CD.
- Uses red laser with short-wavelenght of 650nm (635nm).

- **DVD Vs. CD-ROM**

	CD-ROM	CD-R/RW	DVD-ROM	DVD-R/RW	DVD-RAM
Disc Thickness	1.2mm	1.2mm	0.6*2mm	0.6*2mm	0.6*2mm
Lens NA	0.45	0.45(0.5)	0.6	0.6	0.6
Laser wavelenght	780um	780um	650um	650um	650um
Track pitch	1.6pm	1.6pm	0.74pm	0.74pm	0.615pm
Capacity	0.65GB	0.65GB	4.7GB	4.7GB	4.7GB
Track structure	Pit train	Groove	Pit train	Groove	Land/Groove

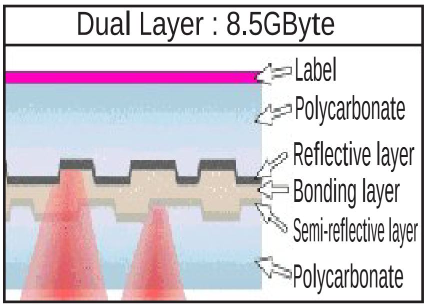
2) Disc Formats

DVD consists of two 0.6mm discs attached together, enabling access to the upper and lower side of the disk, and 4 sides could be used at maximum.



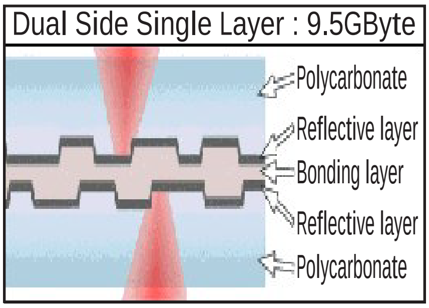
Single Layer : 4.7GByte

Label
Polycarbonate
Bonding layer
Reflective layer
Polycarbonate



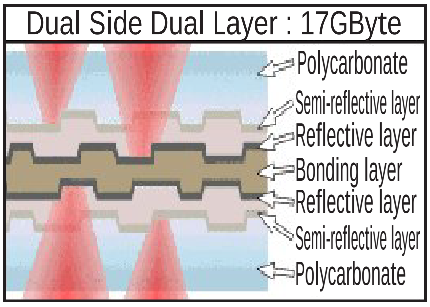
Dual Layer : 8.5GByte

Label
Polycarbonate
Reflective layer
Bonding layer
Semi-reflective layer
Polycarbonate



Dual Side Single Layer : 9.5GByte

Polycarbonate
Reflective layer
Bonding layer
Reflective layer
Polycarbonate



Dual Side Dual Layer : 17GByte

Polycarbonate
Semi-reflective layer
Reflective layer
Bonding layer
Reflective layer
Semi-reflective layer
Polycarbonate

14-1-2 DVD Types

FORMAT	TYPE	APPLICATIONS
DVD-Video	Playback Only	High quality image and sound for movies and other video media.
DVD-ROM	Read Only	Multi-functional, multi-media software that requires large storage capacity.
DVD-Audio	Playback Only	High quality sound that exceeds the CD, multi-channel Audio.
DVD-R	1 Time Recording	As with CD-R, write only once
DVD-RAM	Rewritable (more than 100,000times)	This can be virtually used as hard-disk, with a random read-write access
DVD-RW	Rewritable (About 1000times)	Similar to DVD-RAM except than its technology features a separated read-write access more like phonograph than a hard disk.

14-2 DVD-Video Fromat

14-2-1 Main Features

1) Able to store up to 160 minutes of Movie by utilizing the MPEG-2 compression technology. (Aver. 133min.)

2) Enables more than 500 lines of horizontal resolution. (Class corresponding to the Master Tapes used in broadcasting stations)

3) Provides Dolby Digital 5.1ch Surround 3D sound, which enables theater quality sound (NTSC area).
- For PAL areas, 1 of either MPEG-2 Audio or Dolby Digital must be selected.

4) Multi-Language
- Able to store up to 8 languages of dubbing.
- Able to store up to 32 subtitle languages.

5) Multi-Aspect Ratio
3TV Mode alternatives ; 16:9 Wide Screen (DVD Basic)/4:3 Pan & Scan/Letter Box.

6) Multi-Story
Possible to implement Interactive Viewing which enables the user to select the scenario.

7) Multi-Angle
Able to view the camera angle you selected among the scenes recorded with multiple camera angles.

Note ; The above media features must have the DVD Title that contains the appropriate contents to function properly.

14-2-2 Audio & Video Specifications

Classification		DVD-Video		Video-CD	LD
VIDEO	Compression	MPEG-2		MPEG-1	Analog
	Pixel	720 x 480		352 x 240	
	Horizontal resolution	Max. 500 Lines		Max. 250 Lines	Max.420 Lines
	Compression rate	1/40		1/140	Analog
	Transmission speed	Max. 9.8Mbps (variable)		1.15Mbps (fixed)	
	TV aspect	16:9 / 4:3		4:3	4:3
AUDIO	Audio	Max. 8 streams		2CH stereo	2 Analog CH. 2 Digital CH. (16Bit/44.1KHz) or 1 Analog CH. 1 Stream of Dolby Digital 2 Digital CH. (16Bit/44.1KHz)
	Recording type	Dolby Digital	Linear PCM	MPEG-1 Layer 2	
	Transmission rate	448Kbps/stream	6.144Mbps/stream	224Kbps	
	Channel	5.1CH/stream	8CH/stream	2CH	
	Sampling frequency	48KHz	16, 20, 24Bit/48, 96KHz	16Bit/44.1KHz	

14-2-3 Detailed Feature

DVD-Video Feature 1

When Developing the DVD Software, various addition and modification is possible.

As the storage capacity increases, the DVD-Video separates the main data and the additional data such as the Multi-Function into different data areas, enabling the control of time-data ratio to provide the format that enables the flexible Software development

- 1 Movie (3.5Mbps)
  + Subtitle (1 Language)
  + Surround Audio (1 Language)
  = 160min storage (4.673Gbytes)

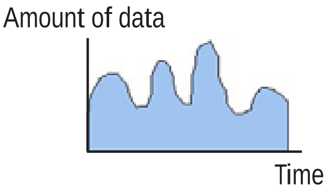
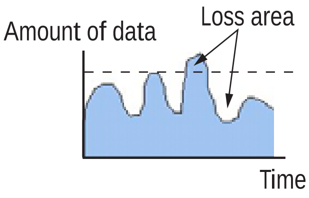
- 1 Movie (3.5Mbps)
  + Subtitle (4 Language)
  + Surround Audio (4 Language)
  = 160min storage (4.680Gbytes)

- 1 Music Video (4Mbps)
  + 2ch High quality Audio (96kHz/24bit)
  = 72min storage (4.648Gbytes)

DVD-Video Feature 2

Application of the MPEG-2 compression technology.

DVD-Video uses the variable compresion technology, the MPEG-2 to compress the moving image optimally, minimizing the Data loss to Provide a clear, natural screen while increasing the storage time.

DVD-Video	• MPEG-2 (Variable compression : Max. 1/40) - Field unit compression. - Compression rate change according to the amount of Data. - Differentiates the still image and the moving image compression rate, reducing Data loss and enables efficient compression. 
Video-CD	• MPEG-1 (Fixed compression : Max. 1/140) - Frame unit compression. - Compresses all data using the same ratio. • Fast movements are jagged, and unnatural 

DVD-Video Feature 3

High quality surround audio.

DVD-Video can store the audio using the 5.1ch Dolby Digital compression or the advanced Liner PCM method, providing the better-than-CD quality and theater like audio quality.

- DTS (Digital Theater System)
  Home theatre and music playback in the home, DTS provides high quality 5.1-channel surround sound with many extras not offered by other consumer formats. As well as handling DTS-branded releases from a growing number of music labels and consumer software producers, DTS provides enhanced 6.1 matrix and DTS 6.1 discrete decoding that envelopes the listener in sound. DTS technology is featured in a wide cross section of receiver/pre-amplifiers, DVD players and and add-on components from leading consumer audio vendors

- Dolby Digital (AC-3)
  - Unlike the traditional Dolby pro-Logic method, the Dolby Digital method separates all 5 main channels (Front L/R, Center, Surround (Rear) L/R)and the Sub woofer to provide live surround audio.
  - Using the Down Mix method, the conventional Dolby Pro-Logic and Stereo are all compatible.
  - Each separated channels are played back at CD quality sound. (Frequency band: 20Hz ~ 20KHz)

- Linear PCM (Pulse Code Modulation)
  - Provides the high quality Digital sound without the audio data compression.
  - Various Digital Recordings are possible as shown in the table to the right.

Sampling Frequency	Bit Rate
48KHz	16bit
	20bit
	24bit
96KHz	16bit
	20bit
	24bit

- Dolby Digital compatible Audio Mode

Audio Coding Mode	Channel Format					Remark
		Front		Surround (Rear)		
	L	C	R	L	R	
1/0		O				Mono
2/0	O		O			Stereo
3/0	O	O	O			Surround
2/1	O		O	Mono		
3/1	O	O	O	Mono		
2/2	O		O	O	O	
3/2	O	O	O	O	O	

DVD-Video Feature 4

Multi-Language

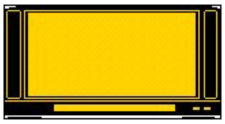
- Audio Dubbing - Max. 8 Languages
- Subtitle - Max. 32 Languages. Capable of storing, and selectiong.
- Linear PCM (Pulse Code Modulation)

DVD-Video Feature 5

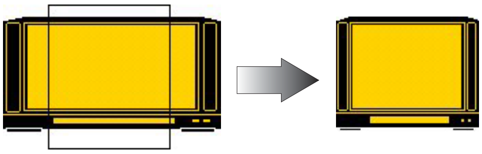
Multi-Aspect

- Unlike the conventional VCD or LD, DVD-Video has the default of 16:9 Wide, and can be viewed using the conventional 4:3 TV, enabling the expansion of viewer selection capabilities.

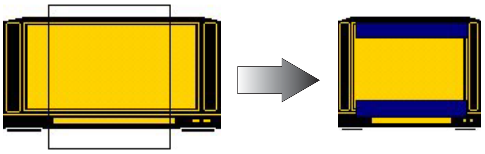
  - 16 : 9 TV : Wide Mode (16:9 Wide Full Screen)
  - 4 : 3 TV : Letter Box Mode, Pan & Scan Mode



16:9 Wide



4:3 Pan & Scan



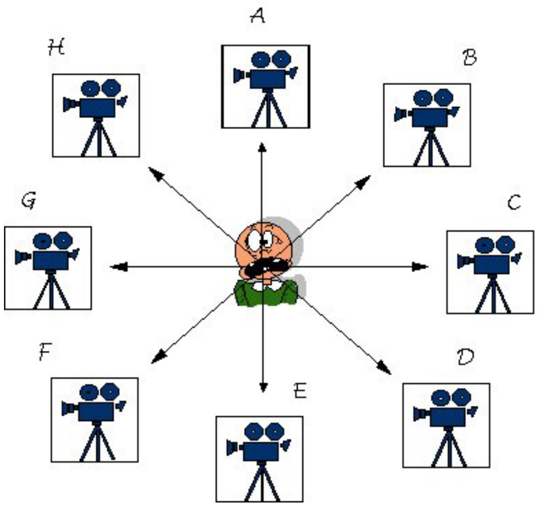
4:3 Letter Box

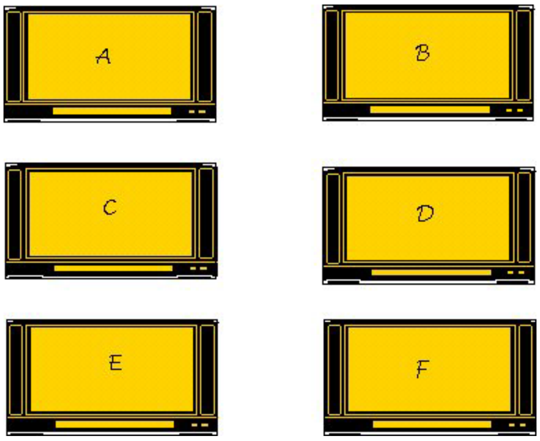
Note ; This function is disc-dependent, may not work on all DVDs.

DVD-Video Feature 6

Multi-Angle

- Up to 9 angles of view may be stored, enabling the viewer to select a specific viewpoint at a given time.
  --> Especially, for the Music Video and Sports Title, this provides a more lively image of the scene.





Note ; This function is disc-dependent, may not work on all DVDs.

DVD-Video Feature 7

Multi-Story

- DVD-Video provides the enviroment suitable for the bi-directional Software develoment, providing multiple scenarios. This feature enables the Multi-Story function.

OPTION

Parental Lock

- For the titles that are not suitable for children viewing, Parental Locks are set, requesting user defined passwords for viewing
- Parential Locks may be set on specific frames of the Title, enabling the player to skip those frames during playback.

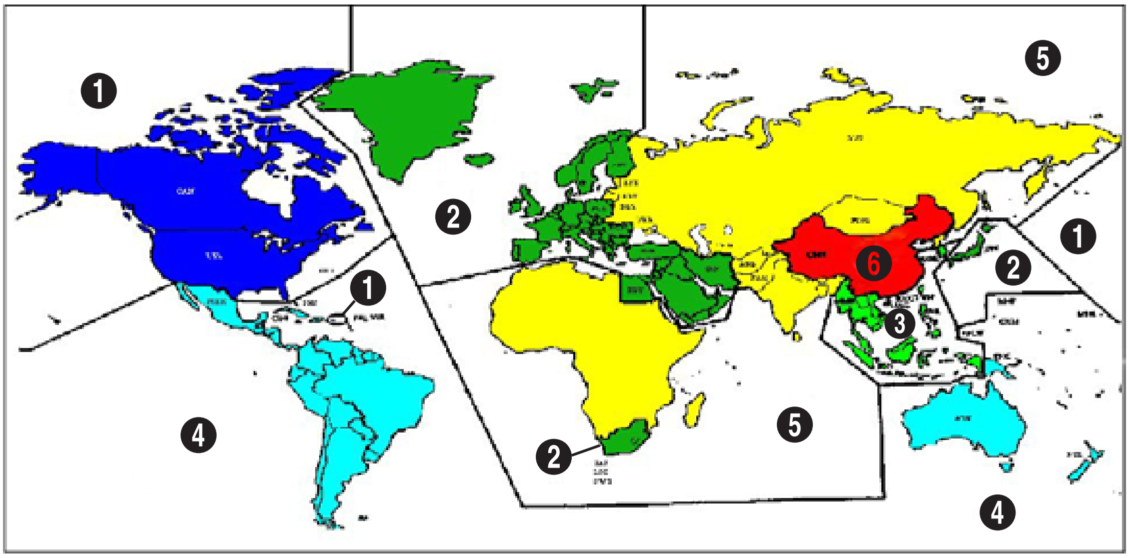
COPYRIGHT

Regional Code & Macrovision

- Classify the world into 6 regions, and if the DVD Title and the Player's "Reginal Code" do not agree, playback is prohibited.

- **Regionnal Coding is optional for the Soft developers (Region 0 All Code), but the Hardware developers must adopt the appropriate regionnal code for sale.**

  - Region 1 : The United States and its territories, Canada.
  - Region 2 : Europe, Japan, Greenland, Egypt, South Africa, the Middle East.
  - Region 3 : Taiwan, Hongkong, Korea, South East Asia.
  - Region 4 : Mexico, South America, Australia, New Zealand.
  - Region 5 : Russia, Eastern Europe, India, Africa.
  - Region 6 : China.
  - Region 0 : Worldwide (All Code)



- Adoptation of the Macrovision System disables the copying on to other media.

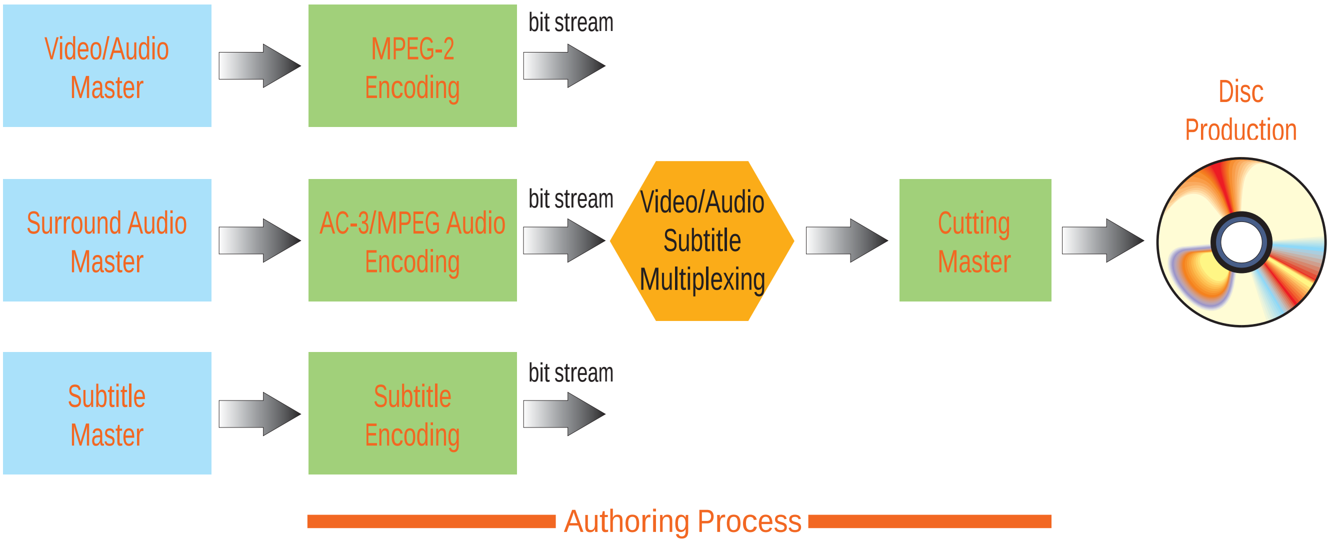
Remark

DVD-Video Authoring Process

- The image quality of the DVD-Video may vary accoring to the quality of the Master and the Authoring Process

  - The image quality of the DVD-Video varies according to the Digital Mastering Source such as the conventional LD, VCD, or Original Film.
  - Different Authoring Process are used accoring to the Software developers, and this may affect the DVD image quality.

- **Authoring Process**


Video/Audio Master
MPEG-2 Encoding
bit stream
Surround Audio Master
AC-3/MPEG Audio Encoding
bit stream
Subtitle Master
Subtitle Encoding
bit stream
Video/Audio Subtitle Multiplexing
Cutting Master
Disc Production
Authoring Process

14-3 About IEEE1394

14-3-1 Comparison between IEEE-1394 and other digital interfaces

Since there are many different interfaces available, for example, RS422, RS644, and USB, vision system integrators are very likely to be confused when choosing the right interface for their application. For the ideal design of a vision system, it is vital to have the right bus/interface. To make things even more complex, there is no easy answer such as IEEE-1394 is the best choice.
Furthermore, the new CameraLink standard, promoted by companies such as Pulnix, Basler AG, and many frame grabber companies, seems to be the state of the art interface. So why should IEEE-1394 be an alternative?

These questions are as complex as mostvision applications and there is no simple guideline .
Each of these interfaces offers many benefits and each of them has its individual drawbacks and restrictions. In the table below, we try to give a brief comparison of the most popular interface systems.

	RS 644 [1]	**CameraLink**	**IEEE-1394**	**USB 2**
Topology	Link	Link	Bus	Bus
Windows Driver	Proprietary	Proprietary	Native (Win 200, Win 98)	Native (Win 200, Win 98)
“Guaranteed” Bandwidth	~20 to 40 MByte/s	~255 MBytes/s	~32 MBytes/s[2]	~38 MBytes/s[2]
Cable Length	~10 m @ 40MHz ~20 m @ 200MHz	~10 meters	4.5 meters	5 meters
Wires Needed for 8 Data Bits	22[3]	10	4	2
Parameter Port	No	≥ 1 KByte/s	~8 MBytes/s [2]	~9 MBytes/s [2]

[1] These specs are for a typical 8-bit camera application operating at 20 MHz or at 40 MHz.
[2] 80% of the bus bandwidth is used for image data and 20% is used for parameter data.
[3] 16 wires are used for data bit transfer and two wires each are used for the separate Line Valid, Frame Valid, and Pixel Clock signals required with RS-644 transmission.

A careful comparison of the specifications shown in the table should be your first selection guide for the interface. For example, for an integrator who needs very high speed, USB 2 and IEEE-1394 are not the first choice. On the other hand, these buses are the ones to select in cases
where multiple cameras are needed or cost is a critical issue. Also, the user needs to be aware
that the D-Cam specification currently does not specifically support Line Scan cameras.
However, the specification is open and line scan support could be achieved via Format 7. As
for USB 2, it is still in its infancy in machine vision and we are not aware of any kind of machine vision support.

14-3-2 Fiexibility and Cost Reduction

Many image processing application engineers face a familiar group of problems when designing and building a system. The end user requires system flexibility, simple adaptation, fast delivery times, and most importantly a reasonable price. With conventional systems, whether analogor digital, engineers must confine themselves to certain combinations of the existing cameras, frame grabbers, and software. The product choice for this system configuration is limited. Unless the decision is made to use a high cost frame grabber that supports multiple cameras, sometimes known as multi-norm , it is usually not possible to operate cameras with different resolutions from the same frame grabber.

For many applications, the introduction of digital cameras is hindered by the cost specified by the end customer, however technically effective digital cameras may be. With the increased use of IEEE-1394 in the industrial image processing business, many of these problems are solvable in a sure , safe , and cost effective way.

1) Hardware Cost Example

This example compares two similar vision systems. Each system uses four Megapixel resolution digital cameras . The traditional solution consists of one frame grabber per camera, one parallel digital data cable per camera, and one power supply per camera.

The 1394 solution requires one hub and one interface card to connect the four cameras , along with five inexpensive 1394 cables. The 1394 cables carry power to the cameras directly from the computers internal power supply. (Note that not all computers are capable of supplying enough power for the cameras. In some cases a separate power supply may be required.)

Traditional Solution with multiple frame grabbers	Price	1394 Solution	Price
Four Cameras	18,000	Four 1394 Cameras	18,000
Four Frame Grabbers	4,400	One 1394 Interface Card	100
Four Cable	400	One 1394 Hub	120
Four power Supplies	320	Five Cables	150
Total	$23,120	Total	$18,370

14-3-3 Application Examples

Today, there are already applications realizing the benefits of IEEE-1394 technology. For example, at one of our customer sites, Basler was faced with a vision system which has the following specifications:
The machine is a high-speed assembly system . Two independent robots take different parts
(different in size, shape, and reflection) from a support unit and mount these parts on a mounting plate. Timing is crucial, and in the worst case, a part must be taken from the tray every 100 ms. Accuracy of parts mounting is also critical (0.5 mm) . To have a vision system inspecting these operations , 4 cameras (2 on each of the robots) are needed:

- 2 low resolution Basler A302f cameras (640 x 480) for checking if the mounting plate is in place
- 2 high-resolution Basler A101f cameras (1300 x 1030) for checking the components to be mounted.

Since most of the parts are different, the two A101f cameras must be reconfigured before almost every image acquisition. In the worst case, the AOI, shutter, and sometimes gain need to be adjusted.

1) Solution used before Basler s Intervention

The customer used analog cameras with CCIR resolution (768 x 582) only. This drastically restricted the number of parts which could be mounted using the robots. Since these cameras had no communication port for configuration, adjusting the AOI was not possible and differences in reflection of the parts needed to be adjusted for by driving a flash circuit. All cameras were interfaced into one frame grabber (one PC).

2) Possible solution wih digial cameas using RS 644 OR Camera Link

Using RS 644 or CameraLink based cameras, the customer would need one frame grabber for
each camera. It is very likely that the user would need two PCs (one for each robot). Changing the camera-configuration on the fly would require advanced grabber cards since simple grabbers are not capable of easily changing their registers for different AOIs.

3) IEEE-1394 solution

All cameras are attached to a single interface card in the PC. The Basler A302f is only used when a new mounting plate is positioned by the handler. In normal operation , only the two Basler A101f cameras will be sending data at the same time and they will be operating at about 10 FPS. This results in a data rate of about 27 MBytes/s, which is well within the specification for IEEE-1394.

Since IEEE-1394 supports bi-directional communication between the camera and the PC, before each frame capture , the PC can easily change resolution, gain , offset, shutter speed, or whatever is required.

The IEEE-1394 solution results in these clear advantages for the customer:

- Onlyone PC,

- Only one interface card (very inexpensive compared with frame grabber cards),

- Easy and inexpensive cabling ,

- The system meets the expectations for speed and accuracy,

- The range of inspectable parts is much bigger than with the old system.

14-4 What is HDMI?

14-4-1 What is HDMI?

HDMI (High-Definition Multimedia Interface) is the first industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any audio/video source, such as a set-top box, DVD player, and A/V receiver and an audio and/or video monitor, such as a digital television (DTV).

HDMI supports standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable. It transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements.

14-4-2 Who supports HDMI?

The HDMI Founders include leading consumer electronics manufacturers Hitachi, Matsushita Electric Industrial (Panasonic), Philips, Sony, Thomson (RCA), Toshiba, and Silicon Image. Digital Content Protection, LLC (a subsidiary of Intel) is providing High-bandwidth Digital Content Protection (HDCP) for HDMI. In addition, HDMI has the support of major motion picture producers Fox, Universal, Warner Bros. and Disney, and system operators DirecTV, EchoStar (Dish Network) as well as CableLabs.

14-4-3 How do consumers benefit from HDMI?

The new HDMI digital interconnect provides:
Superior, uncompressed digital video and audio quality
Simple, user-friendly connector that replaces the maze of cabling behind the entertainment center Integrated remote control
A popular interface enabling the transmission of high-definition content. HDMI opens the floodgate of digital content from major motion picture producers
When will the HDMI specification be released?
The HDMI 1.0 specification is available now. CE manufacturers may begin designing products incorporating the HDMI standard-addressing consumer demand for HD programming and for DTVs that display this content.

14-4-4 How can I get the HDMI 1.0 Specification?

Parties interested in obtaining the HDMI 1.0 Specification are required to first download and sign the HDMI Adopter Agreement or Test Equipment Maker Agreement (available at agreements) and remit payment of the annual fee. Once payment and two signed copies of the appropriate agreement have been received, HDMI Licensing, LLC will send a login name and password to the registered email address in order to download the 1.0 Spec.

14-4-5 Can I review the HDMI Specification before deciding to pay for a license?

The HDMI Specification is only available to those parties that have signed an Adopter Agreement and remitted their payment. However, the HDMI Founders have created an Informational Version of the Specification that interested parties can review to help them determine if they want to license the complete version of the Specification.

14-4-6 When will prototypes of HDMI products be available?

HDMI-based prototype devices were first demonstrated at CES in January 2003. The CE industry is currently transitioning from DVI to HDMI connections. Backward- compatible with the DVI 1.0 specification, HDMI enables both multi-channel digital audio and uncompressed video transmission over a single cable and connector, and in combination with HDCP addresses content providers' requirement for a secure interface to protect high-quality content from unauthorized redistribution.

14-4-7 When will consumers be able to purchase products with HDMI?

The first HDMI products were announced in Q3 2003 and are expected to be available for consumer purchase in the fall of 2003.

14-4-8 What is the life expectancy of HDMI?

HDTV uses less than 1/2 of HDMI's available 5 Gbps bandwidth. With capacity to spare, HDMI can incorporate new technology advancements and capabilities long into the foreseeable future.

14-4-9 When will the details of the licensing terms be available? How do I obtain a license to the HDMI Specification?

HDMI is licensed under reasonable and non-discriminatory terms. The Adopter Agreement or Test Equipment Maker Agreement detailing the licensing terms is available at agreements. Please follow the instructions for downloading and submitting the appropriate agreement along with your payment in order to obtain a license to the Specification.

14-4-10 What's the difference between the Adopter Agreement and the Test Equipment Maker Agreement, and which one should I sign?

The Adopter Agreement is offered for those parties that desire to make and sell HDMI-based products such as DVD players, Set-top boxes, TVs, semiconductors, cables and connectors, etc. The Test Equipment Maker Agreement is offered for those parties that desire to make and sell test equipment such as oscilloscopes, wave form generators and other measurement tools designed to assist manufacturers in using the Compliance Test Specification to test their HDMI products for compliance with the HDMI Specification.

14-4-11 Does HDMI provide a secure interface?

HDMI, when used in combination with HDCP, provides a secure audio/video interface that meets the security requirements of content providers and systems operators.

14-4-12 What are the advantages of HDMI over existing analog interfaces such as composite, S-Video and component video?

Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
All Digital HDMI ensures an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions.
Low-cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner.
Audio HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound.
Ease-of-use HDMI combines video and multi-channel audio into a single cable, eliminating the cost, complexity, and confusion of multiple cables currently used in A/V systems.
Intelligence HDMI supports communication between the video source (such as a DVD player) and the DTV, enabling new functionality.
Is HDMI backward-compatible with DVI (Digital Visual Interface)?
Yes, HDMI is fully backward-compatible with DVI using the CEA-861 profile for DTVs. HDMI DTVs will display video received from existing DVI-equipped products, and DVI-equipped TVs will display video from HDMI sources.

Will current HD TVs and set-top boxes using DVI-HDTV be compatible with HDMI devices?
Yes. Currently there are TVs with DVI-HDTV inputs available from a variety of manufacturers. Those devices will be compatible with future HDMI-equipped products.

14-4-13 What types of video does HDMI support?

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and even 1080p). It also has the flexibility to support enhanced definition formats such as 480p, as well as standard definition formats such as NTSC or PAL.

14-4-14 What is the Compliance Test Specification?

The Compliance Test Specification (CTS) was developed by the HDMI Founders to assist manufacturers in ensuring the compliance of their products with the HDMI Specification. It consists of numerous tests designed to check for compatibility of various HDMI-related aspects of a product, including audio, video, EDID, electrical signaling, protocols, etc. The HDMI Compliance Test Specification represents the minimum compliance testing required for HDMI products, and it is up to each manufacturer to fully test product functionality and interoperability.

14-4-15 How can I get the Compliance Test Specification?

The 1.0 version of the Compliance Test Specification is available to all parties that have licensed the HDMI 1.0 Specification.

14-4-16 What is an Authorized Testing Center and how do I contact one?

The HDMI Founders have established certain Authorized Testing Centers (ATC) where licensed manufacturers can bring products for compliance testing. Currently, ATCs are located at Matsushita Electric Industrial in Osaka, Japan, and Silicon Image in Sunnyvale, CA, USA. The ATC's can be contacted as follows:

14-4-17 Does HDMI accommodate long cable lengths?

Yes. HDMI technology has been designed to use standard copper cable construction at long lengths. In order to allow cable manufacturers to improve their products through the use of new technologies, HDMI specifies the required performance of a cable but does not specify a maximum cable length. Cable manufacturers are expected to sell reasonably priced copper cables at lengths of up to 15 meters. As semiconductor technology improves, even longer stretches can be reached with fiber optic cables, and with active cable technologies such as amplifiers or repeaters.

14-4-18 When will HDMI cables be available?

Due to the rapid adoption of HDMI among CE manufacturers and the demand we are seeing from end-customers, HDMI Licensing, LLC is in active discussions with cable manufacturers about supplying the retail channel with HDMI cables. Since the vast majority of the market requires 5m and shorter cables, we expect manufacturers to make these cables available first. We do expect some manufacturers to market 5-15m (and beyond) HDMI cables as the market dictates and on a more limited basis. We will post this information on the HDMI website as it becomes available.

TOSHIBA CORPORATION
1 1, SHIBAURA 1 CHOME, MINATO KU, TOKYO 105 8001, JAPAN